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ON THE OCCURRENCE OF SOLID HYDROCARBONS IN PLANTS.

A Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.

By Helen C. De S. Abbott and Henry Trimble.

When many plants of the higher botanical orders are exhausted with petroleum-ether, crystalline compounds may be separated from the extracts which have not been noticed previously to these investigations. These compounds are also obtained when alcohol or ether is used as a solvent; but it is preferable, on account of the greater number of constituents extracted by these menstrua, to employ petroleum-ether, and thus avoid certain difficulties of separation. Among the plants in which up to this time these compounds have been discovered may be mentioned: *Cascara amarga*, *Phlox Carolina* and the *Phlox* species, *Anthemis nobilis*, and in different species of the following natural orders: Rubiaceæ, Rhodoraceæ, Eupatorieæ and other Compositæ.

The crystals from these petroleum-ether extracts first attracted attention in the winter of 1884. Samples of "chichipate" bark which yielded, on powdering, about two hundred grammes were then obtained and submitted to chemical examination. This bark was subsequently, from chemical analysis, identified as Cascara amarga.[1]

Other investigations prevented the announcement of this work until some time later, under the title of "Preliminary Analysis of a Honduras Plant named 'Chichipate.'"[2] In this paper a new crystalline compound was described and identified by its physical and

[1] Jour. Franklin Inst., Vol. CXXIV, p. 1, Abbott.

[2] By Helen C. De S. Abbott. Amer. Assoc. Adv. of Science, Buffalo, Aug., 1886.

chemical properties as a "camphor-like body." Its analysis gave the following results:

	I.	II.
C.	80·84	80·90
H.	10·13	10·11

A compound resembling the one from "chichipate" was also discovered later in *Phlox Carolina*,[1] and the account of it was read before a meeting of the American Pharmaceutical Association at Providence, R. I., September, 1886. The combustions of this camphor-like substance gave the following:

	I.	II.
C.	82·49	82·57
H.	11·11	11·23

From subsequent study, we were led to believe that the above results were based upon a mixture of compounds. Because of the small amounts of crude material then at our disposal we were not able to overcome the difficulties inherent in purifying and separating these substances. However, from the preliminary investigations we were induced to think that these compounds presented features of unusual interest and novelty.

Recently we began anew our studies upon twenty-five and twenty kilos of *Cascara amarga*[2] and Phlox Carolina respectively.

The drugs were very thoroughly exhausted with a light petroleum-ether, boiling point under 45° C. The total solids extracted from *Cascara amarga* were 2·015 per cent.; of this about 0·1 per cent. were fats. The yield from *Phlox Carolina* was 1·00 per cent., including traces of coloring matter. On heating to 110° C., there was no appreciable loss of weight in *Cascara*. The *Phlox* contained small quantities of volatile oil.

The extracts on evaporating spontaneously deposited upon the sides of a dish or beaker glittering, white, feather-like crystals, often several centimetres in length. At the bottom of the glass were stellate groups of brilliant acicular crystals. Fats, wax, and in *Phlox* a red coloring matter, accompanied the crystalline principle, and rendered the subsequent purification tedious and difficult.

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[1] On the underground portion of Phlox Carolina. By Henry Trimble, Amer. Jour. Pharm., Vol. 58, p. 479.

[2] I am indebted to Parke, Davis & Co., Detroit, Michigan, for the generous supply of *Cascara amarga* received from them. Helen C. De S. Abbott.

The method finally adopted to purify, upon freeing the petroleum-ether residue from fats and coloring matter, was to treat the residue with boiling absolute alcohol, filter out the wax, which separated on cooling, and allow the filtrate to evaporate at the ordinary temperature. By fractional crystallization at least three substances of different and definite crystalline forms have been separated. We have, at present, examined only one of these constituent compounds; whether the others are the result of oxidation during the separating and purifying processes or exist as such in the plants, we are now unable to state.

The subject of our communication is the compound the least soluble in alcohol of the three obtained by fractionation. It formed silky, acicular crystals, often two to four centimetres in length, which, under polarized light, gave a play of colors. It also exhibited decidedly electrical properties. To determine the melting point, about 0·5 of a gram of the crystals were placed directly in the inner tube of an apparatus devised by Roth, for the determination of melting points. The substance melted at 196·2° C. to 196·4° C., leaving a clear, amber-colored mass. On heating to a higher temperature, the substance decomposed and vapor was driven off in dense clouds. It had an odor very like sandal wood; when condensed upon a cool surface, the sublimate consisted of fluffy crystals of a lower melting point.

The silky, acicular crystals were soluble in petroleum-ether, ethylic and acetic ethers, benzole, chloroform, hot alcohol, glacial acetic acid, acetic anhydride and linseed oil. The addition of water to the acetic anhydride reprecipitated the substance, in white, flakey masses. The crystals were insoluble in hot, cold or acidulated water, or in the alkalies or other hydrate solutions; insoluble in amyl alcohol and alcoholic soda. Nitric and sulphuric acids dissolved the crystals; sulphuric acid gave a reddish-brown coloration.

The first ultimate analyses of this purified product from *Cascara amarga* gave the following results:

	I.	II.	III.
C.	86·30	86·29	86·33
H.	12·96	12·96	12·83
	99·26	99·25	99·16

While the mean per centage obtained from these combustions indicated oxidation or the presence of adherent impurities, they also pointed strongly to the conclusion that the compound was a solid hydrocarbon.

The announcement of this discovery was reserved until it should be confirmed by further study. But a paper describing generally the occurrence of crystalline compounds rich in carbon was read, by title, last summer before the American Association for the Advancement of Science.[1] This inference has been put beyond doubt by the further study of the compound from *Cascara amarga* and *Phlox Carolina* during the past winter, obtained from an additional supply of these drugs.

Twenty-five kilos of Cascara amarga were extracted and the residue purified by often repeated fractional crystallizations, from which the following results were obtained:

0·1058 grms. gave 0·3413 C O_2 and 0·1133 H_2O.
0·1113 grms. gave 0·3588 C O_2 and 0·1193 H_2O.

	I.	II.
C.	87·97	87·89
H.	11·89	11·90
	99·86	99·79

From the plants mentioned at the beginning of this paper in which this crystalline principle exists, the *Phlox Carolina* was also selected as the one to confirm still further the presence and identity of this principle and its chemical composition.

Recently about 15 kilos of this drug were exhausted and the compound separated and repeatedly purified. Its ultimate analyses gave the following:

0·1117 grms. gave 0·3600 C O_2 and 0·1208 H_2O.
0·1314 grms. gave 0·4228 C O_2 and 0·1421 H_2O.

	I.	II.	Theory for $(C_{11}H_{18})_x$
C.	87·90	87·76	88·00
H.	12·02	12·02	12·00
	99·92	99·78	100 00

The above results indicate that this compound is an unsaturated hydrocarbon, and we intend to make it the subject of a thorough chemical investigation with a view of ascertaining its chemical constitution.

Whilst the discovery of the hydrocarbon resulted from independent investigations on different plants, we are agreed that the identity of the compounds justify us in publishing together these results of our studies.

PHILADELPHIA, June 20th, 1888.

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[1] By Helen C. De S. Abbott, New York, August, 1887.

MAIZE OIL (OIL OF CORN)[1].

By J. U. Lloyd.

It is well known that Indian corn contains considerable quantities of fixed oil, and some years ago endeavors were made to separate this oil from the ground corn before it was mashed in the making of whisky. The writer remembers that the late John Crawford, well known as a Cincinnati pharmacist, embarked in a venture with this object in view and some twelve years ago established a factory in Kentucky opposite the city of Cincinnati for the purpose of making bisulphide of carbon, which was used as solvent to remove the oil. The meal was percolated with this bisulphide of carbon, whereby the fixed oil was removed, and the bisulphide of carbon was afterward recovered by distillation.

It was thought by Mr. Crawford that the cornmeal so treated yielded a larger amount of whisky and of finer quality than when the crude meal was worked. However, after devoting some years to this industry and establishing the carbon process in several sections of the country in connection with distilleries, it was found, I think, that objections rendered it impracticable and that the advantages derived from the process were more than overcome by the disadvantages that followed. In consequence, if I remember correctly, even before Mr. Crawford's death, the schemes were dropped and the industries abandoned.

It has been found in the making of starch and perhaps in other directions as well, that it is desirable to get rid of the germs of the corn, as for reasons that it is unnecessary for me to mention, this germ is objectionable in these manipulations.

In order to accomplish the last result a machine has been devised that degerminizes the corn, throwing the hard starchy part of the corn in one direction and separating the germs in another, and this method can be, and is applied to the making of starch in large quantities and is found to be of great assistance and advantage.

Naturally, there was an accumulation of these excluded germs, which as is well known, constitute a considerable proportion of the corn, and they became a by-product. They were found to be valu-

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[1] Read at the meeting of the Ohio Pharmaceutical Association, Columbus, June, 1888; contributed by the Author.

able as a feed for stock, but really were too "rich" for such purposes, containing as they did a large amount of oil, the oil of the corn being almost altogether found in the germ. In order to render this material more acceptable as a feed for stock a company was recently established for the purpose of squeezing the fixed oil from the germs and thus improving the feed meal. A plant was established a few months ago (the only one in existence now, I learn) in the city of Cincinnati for this purpose and is now in operation. The method is very simple. The germs are conveyed from the factories, wherein they are a by-product (such as starch factories), and are first purified by separating from them a considerable amount of bran or husk of corn that adheres to or is mixed with them. They are then steamed under pressure so as to soften them, after which in the usual manner, by means of hydraulic presses, the oil is squeezed from them.

The process is a very simple one and it yields an oil cake, which when ground into meal is found to be exceedingly valuable as a feed for stock, the manufacturers of this meal claiming that it is superior to corn meal that is made from the whole corn.

Thus it is that in addition to the oil cake, which is the prime object of the industry, there is an accumulation of the fixed oil of corn or maize oil, which induces this paper. I accidentally came across this oil, was led to its examination and as a result, found that it is in many respects preferable as I believe to cotton seed oil that has recently become officinal in the Pharmacopœia as a substitute for olive oil. I have used it in the making of ammonia liniment to which purpose it is particularly adapted, and in which, to my experience, cotton seed oil is practically a failure.

Oil of corn saponifies immediately, forming with ammonia a smooth creamy emulsion that retains its nature apparently indefinitely, as specimens that I have in my possession and which I herewith exhibit, are quite old and are now in their original condition. It does not clot and form masses or curd like aggregations, as we sometimes find to result with olive oil, in accordance with the manner in which ammonia is added to it, and even if for no other use than the making of ammonia liniment I think it should become officinal for that purpose instead of cotton seed oil. However, I doubt if there is any preparation in the Pharmacopœia that demands olive or cotton seed oil in which it cannot be used, and probably it will be found superior in all other

directions. Inasmuch as the industry that yields this oil in course of time promises to increase, and the oil to be obtained in unlimited amounts—indeed it can now be obtained in any quantity, car load lots or otherwise—it is not probable that the output will ever be less than the demand. It is peculiarly of necessity an American production and will always probably be at our command.

The price is reasonable now, in car loads being 40 cents per gallon; of course in smaller quantities, as it will be obtained by the retail druggists, there will be an increase probably reaching 60 cents, but even if the price should be equal to that of cotton seed oil or a little above it, so far as I am concerned, I say that it has proved in my hands enough superior to cotton seed oil for the making of volatile liniment (wherein I suggest its employment), to merit a better price.

Properties.—Maize oil has been analyzed by an English chemist, and the well-known authority, Prof. Chas. O. Curtman, M. D., of St. Louis, has determined its character as follows:

"Oil from embryo of Indian corn, in unrefined state, has a specific gravity of 0.916 at 15°C., which is nearly that of pure olive oil (0.915 to 0.918). The elaidin test shows the presence of a large quantity of olein, intermediate in quantity between olive and cotton seed oils. Its color is a pale yellow brown; its odor and taste that of freshly ground corn meal. It belongs to the non-drying group of the vegetable oils, experiments showing that a very thin layer on paper does not in three weeks' time form a pellicle on the surface exposed to air. In this respect it closely resembles the oils of olive, almond, colza, rape-seed, etc. It does not very rapidly become rancid by exposure to air, and in this regard compares favorably with the best oils. Its use produces no specific purgative effect any more than olive oil. With ammonia or solutions of caustic alkalies it rapidly saponifies, forming a white soap."

ANALYSIS BY F. WILLIAMS, LIVERPOOL, ENGLAND.

Fatty acids (free)	0.88
Total fatty acids	96.70
Unsaponifiable, mucilaginous and albuminous bodies	1.34

The sample is a non-drying oil, and very easy of saponification. Being in a crude state, direct from the mill, I have subjected a portion of the oil to a process of purification or refining, finding the loss sustained to be a little over four per cent.

THE TREATMENT AND DISTILLATION OF PEPPERMINT PLANTS.[1]

By Albert M. Todd.

"It has been claimed that the herb peppermint, when freshly cut yields more oil than when dried. Is this so, and does the increased yield of oil compensate for the increased expense of shipping the fresh herb to the distiller?"

This questiou has long been a disputed one, and the discussions have attracted the interests of both scientists and manufacturers. That the importance of making a determination which would be satisfactory and final will be better understood, I will, before stating the results of my experiments, give a brief description of our novel industry, prefacing the description with the single remark that distillation is effected with three-fold the rapidity from the dry rather than from the green plants.

There are now, [in 1888],[2] cultivated annually in the United States [almost wholly in the states of Michigan and New York], over twenty thousand tons of peppermint plants, yielding over one hundred and twenty thousand pounds of essential oil, thus requiring on the average the production and handling of about three hundred and fifty pounds of plants in the undried state for a single pound of the essential oil. There are now in America, about two hundred and fifty small distilleries, where the crude or natural oil is produced, each distiller distilling, besides his own crop, the plants of about ten neighboring growers on the average, making the number of persons engaged in the industry as principals over two thousand five hundred, beside a large number of workmen employed in the cultivation and distillation.

The distillers' charge for working up the plants of other growers, has by custom been based upon the number of pounds of oil obtained rather than upon the quantity of plants, the present rate in

[1] Read before the New York State Pharmaceutical Association, June 1888; communicated by the Author.

[2] Note.—During the past few years the consumption of peppermint has rapidly increased, so that statistics of production and distilleries now given, show a marked increase over those given in my former papers on analogous subjects, which may be found as follows: in the "Proceedings of the American Pharmaceutical Association" for 1886, page 121, and the "American Druggist" for September 1886, page 161.

Michigan being twenty-five cents for each pound of essential oil. This custom is most satisfactory to the grower, as he pays only according to his receipts, but it will be seen that it is not equitable for the distiller unless the plants are well dried prior to distillation.

The manufacturing system may be briefly noticed as follows: the plants having been cut when in full bloom, are drawn to the distilleries either with or without curing, according to the notion of the grower. The essential features of the distillery are, first, a large boiler for the generation of steam; second, a pair of large wooden vats, about six feet in height and of equal maximum diameter, which are connected with the boiler by steam-pipes, which enter them at the bottom, [two vats being used so that one may be emptied and refilled while the other is running]; third, a condensing apparatus, which consists of a series of pipes coated with pure tin, either with or without the ordinary "worm" over which cold water is made to flow continuously, this condensing apparatus being connected with the top of the distilling vats at pleasure by a duplex or "changing valve"; lastly, is the "receiver" in which the essential oil is collected, the ordinary form of which is a metallic vessel, about twelve inches in diameter and three feet in height, from the bottom of which an exterior pipe leads to a height nearly equal with the body of the receiver. Recently I have constructed a much more efficient and elaborate receiver for rapidly separating essential oils both heavier and lighter than water; but as this paper is not intended as a technical treatise on apparatus, it will not be described here.

About three inches from the bottom of the distilling vats are placed "false bottoms," containing many perforations, underneath which the steam enters from the boiler. Upon this perforated false bottom is placed a strong iron hoop, having a diameter nearly equal with the vat and supplied with heavy cross-bars. Two pairs of strong chains are secured to this hoop, meeting at the top of the vat in a pair of rings, one of which is fastened on either side of the vat at the top while it is being filled. This apparatus, as will be seen, is for the purpose of drawing the charge from the vats after distillation.

The apparatus being in position, the plants are thrown in by a workman with an ordinary hay-fork, while two or three others are engaged in "tramping them down." After the vat is about one-third full, a small supply of steam is let in, which softens the plants and greatly assists in packing. When filled, the vat is closed with a

steam-tight cover, and the other charge being now distilled, the entire amount of steam is turned on in the new one. The steam comes up through the perforations of the false bottom, and is diffused evenly through the plants. The oil is contained entirely in the minute cells of the leaves and blossoms. The action of the steam is two-fold; it softens the tissues of the cells and at the same time, by its heat, causes an expansion of the particles of oil, so that they burst forth from their miniature prisons, and are carried off with the current of steam. The steam, now charged with the essential oil, upon reaching the top escapes into the condensing apparatus, where it assumes the form of oil and water. Separation takes place in the receiver; the water, being heavier, sinks to the bottom, and is forced by the pressure from within, upward and out through the exterior pipe referred to. The oil collects on the top and is dipped off at pleasure.

As stated, distillation can be effected with three-fold the rapidity from the dry plants, for the effect of drying is to soften the plants, allowing a larger quantity to be used for a charge, while such large charge can also be distilled in one-half the time required for a smaller quantity of green plants. But many growers, fearing that a loss of oil results from drying, by diffusion in the atmosphere, cannot be prevailed upon to bring their plants to the distilleries other than in a green state. The extremes of difference I have noticed are as follows: From a charge of two thousand pounds of dry plants, well covered with leaves and blossoms, thoroughly dried, I have obtained twenty pounds of oil in thirty minutes, an hourly rate of forty pounds of oil and two tons of plants. From a similar charge of very coarse plants, with few leaves and blossoms, distilled in the green state, less than two pounds were obtained, requiring one hour for their distillation.

Upon a clear day in September, in the middle of the day, two loads of plants were cut down side by side at the same time. Both loads were immediately raked up in the green state, containing all the natural juices of the plant, then drawn to the scales and weighed. One load was immediately distilled, the other load being spread upon the ground and dried for two days in the sun. At this time the plants had become freed from nearly every particle of moisture, the leaves being so dry and brittle as to break off quite readily in handling. This second load, which had thus been dried in the sun and open air, was now spread out in a loft and exposed to a further drying and the action of the atmosphere for a little over six months.

The first charge of peppermint, which was distilled in the green state, weighed 2332 lbs. and produced 6 lbs. 9 oz. of essential oil, being one pound of oil for each 355·35 lbs. of plants, or 0·2814 per cent. After the second load had been dried and exposed to the atmospheric action as stated, for a little over six months, it was taken from the loft and distilled. I would say here that all the oil in the peppermint, as indeed in most, if not all, essential oil plants, is obtained from the leaves and blossoms. However, in distilling, the yield was more than one pound of essential oil for each 362·5 lbs. of original green plants, which slight loss (about two per cent. in the amount of essential oil), is certainly to be accounted for by the portion of leaves and blossoms which rattled off in the re-handlings. The charge of peppermint, which was thus fully dried, had shrunk 49·4 per cent. of its original weight.

It will thus be seen that although the plants are very aromatic both before and after cutting, there is no perceptible loss of the essential oil by a thorough drying of the plants prior to distillation, the oil being so tightly sealed in its little prison cells that a force greater than that existing in the atmosphere or the rays of the sun is necessary to free it. Indeed, I have noticed that the leaves which fall from the plants in dry seasons and remain upon the ground over winter, even though subjected to rains and snows as well, are often found months afterward to be so strong that one would hardly suppose that any of the strength had passed off. It is known though in practical experience that when the plants are once dried and subjected to rains, the water carries of a portion of the oil, acting in that respect as a slight distilling force.

It is not within the scope of the present article to treat of the chemical effect produced upon the oil by the action of the atmosphere, the tests of the oil, etc. Such determinations may be found by consulting the papers referred to in the note below. The principal results of the experiments recorded herein may be summarized as follows:

First.—In the treatment of peppermint and such other American essential oil plants as have been examined, no perceptible loss of the essential oil by diffusion in the atmosphere is occasioned by a thorough drying of the plants prior to distillation, in the open air at any ordinary temperatures.

Second.—When the drying of the plants is continued through many months, a slight oxidation of the oil in the leaf occurs through con-

tact with the oxygen in the atmosphere, decreasing its solubility, and increasing its specific gravity; also raising its boiling point through the formation of a non-volatile and insoluble resinoid produced by oxidation.

Third.—A long exposure of the plants to atmospheric action prior to distillation, does not affect the crystallizing tendency of the essential oil, nor other of its physical tests except those noted, so far as investigated.

Fourth.—To obtain the best results, both as to the quality of essential oil and economy of transportation and distillation, the plants should be dried as thoroughly as possible without endangering the loss of the leaves in handling. Distillation should then take place as soon as convenient, to prevent the oxidation of the oil in the leaf by atmospheric action.

NOTE.—Since writing the above, I just notice a paper by Mr. Joseph Schrenk, in the *American Druggist* for June, 1888, which corroborates the determination given in the above paper. Speaking of the crystals in the leaves of plants which have been dried for fifty years, he says: "It is remarkable how long these crystals will remain in the dried leaves. Fragments from an herbarium specimen gathered in Europe, in 1827, contain them in as perfect a condition as leaves of plants collected quite recently."

THE GENUS LUFFA.[1]

BY JOHN M. MAISCH.

During the last six or eight years the so-called *towel-gourd* has attracted some attention, and the fibrous tissue of the fruit is now found in a number of pharmacies, where it is sold under the names of *vegetable sponge*, *luffa-sponge*, or *wash-rag*. The plant from which this article is derived is indigenous to Upper Egypt and other parts of tropical Eastern Africa, and belongs to the cucurbitaceous genus Luffa which is confined to the tropics, and is botanically closely related to Momordica, the genus yielding the well-known balsam-apple of our gardens; but, while the ripe fruit of the latter is dehiscent in an irregular manner, that of the Luffa separates at maturity an operculum

[1] Read before the Pennsylvania Pharmaceutical Association, at Titusville, June 13.

or lid, which is formed by a kind of disc upon which the floral organs were situated.

The plant is known as Luffa ægyptiaca, *Miller*, and formerly as Momordica Luffa, *Linné*. It grows to the length of 20 or 30 feet, and has an angular tough stem which climbs by means of long and strong spirally twisted tendrils. The alternate leaves are roundish in outline, with a heart-shaped base, and with the margin divided into five lobes. The flowers are rather large, the corolla of a yellow color; the staminate flowers in racemes; the pistillate flowers solitary, with an elongated ovary and a three-lobed stigma. The fruit attains a length of from 10 to 20 inches, is two or three inches thick, elliptic in shape, but thinner towards the base; of a green color, externally marked by ten blackish longitudinal lines and opens at the apex by a flattish conical lid. The numerous seeds are oval, or oval-oblong, nearly half an inch in length and one-quarter inch broad; flat, slightly margined at both ends and of a dull blackish color. The testa is finely reticulate, and near the hilum on each side marked with two short ridges forming an obtuse angle. The embryo is of a greenish-white color and has an oily taste.

The part used is the net-work of fibres in the interior of the fruit. Strong fibrous bundles are found in the pericarp under each of the longitudinal black lines; similar bundles are also contained in the (normally) three placentas, which project from the pericarp toward the centre of the fruit, are there divided each into two branches and curve back again to near the pericarp. These longitudinal fibres, with their anastomosing branches following the same direction, are located in the inner layer of the net-work, while other branches running transversely form a similar outer layer, and in the placentas are arranged in strata, between which the numerous seeds are securely imbedded. To obtain this interwoven fibrous tissue, the ripe fruit is either kept in a warm and damp place for several weeks until the softer parenchyma becomes rotten, when it is removed together with its mucilaginous contents by repeated washing with water; or, without allowing the fruit to undergo this softening process, an incision is made longitudinally through the outer layer of the ripe pericarp, and the soft tissue with contents is removed by soaking in water, pressing with the hands and repeated washing, during which manipulation the seeds are likewise discharged through the longitudinal channels between the fibrous web.

When dry, this net-work is of a yellowish or dingy-white color, and rather hard and rough, though flexible; it readily absorbs moisture, becoming soft, though retaining its firmness, and in a slightly damp condition may easily be compressed. It is not unlikely that in this state it may be found useful as a surgical appliance for the absorption of liquid discharges, and bandages made of it have been employed to some extent in Europe. This absorbing power, combined with great durability and a certain amount of elasticity, have led, in Germany, to the manufacture of *luffa soles*, which are claimed to be more useful and serviceable in cases of sweating feet than soles made of felt or other material, by completely absorbing the perspiration and still retaining between the meshes a thin layer of air; moreover, they may be readily cleaned by washing with soap and water. The properties mentioned have also caused the material to be made into saddle undercloths which take up the perspiration of the sweating animal.

In Egypt, where the plant has long been cultivated, the luffa sponge is used for straining liquids, for scouring and scrubbing, and as a flesh-brush for friction in certain skin diseases; since its introduction into the United States it is employed mainly as a bathing sponge and as a flesh-brush, for which purposes it is well adapted in consequence of its lightness, texture, durability and the ease with which it is cleaned.

The plant is readily raised from seeds and is a rapid grower; if germinated early, it will flower and ripen its fruit in the latitude of Philadelphia before the cool autumn weather sets in, a light sandy soil being apparently better adapted for securing its perfection than a heavy and rich soil. Full-grown fruits, not completely maturing before cool weather, may be ripened by keeping them in a warm room; but in this case the fibrous net-work will be more delicate in texture and less resistant to wear. Being an annual of tropical origin, the plant will grow with little or no attention in the Southern States, where it is now raised to some extent as an arbor vine. But the vegetable sponge met with in our commerce is perhaps altogether imported from Europe, and, considering the low price at which it is sold here at retail, is probably of Egyptian, or at least Oriental, origin. It is imported uncut, or, in other words, in the same shape in which it exists in the fruit, and may be employed in this condition, more particularly as a bathing or washing sponge, since the outer

layer is smoother and softer than the inner layer, which is harder and rougher from the, both longitudinal and transverse, direction of the fibres, and from the projection of the placental tissues; hence the inner side is more effective for friction.

While the fruit in its pulpy portion has mainly a mucilaginous, not very inviting taste, it is to some extent used as a food by the poor people of Eastern Africa. The fruit of Luffa Petola, *Seringe*, is eaten in China and in some of the East India islands, and of the East India species Roxburgh mentions *Luffa pentandra* and *L. acutangula* of which the unripe fruit is edible. The last named species is more widely distributed than any other of the same genus, being indigenous not only to Southern Asia, as far northward as Afghanistan, but likewise to the West Indies and to South America as far as Brazil. In the West Indies it is commonly known as *strainer-vine*, very likely in allusion to the use made of the fibrous frame-work of the fruit. A variety of this, or a closely allied species, is Luffa amara, *Roxburgh*, which has also a cucumber-like fruit, about four inches in length and provided with ten sharp longitudinal ridges or angles. The entire plant has a very bitter taste, more particularly the leaves, which, according to Prof. Dymock, are used as an external application to sores in cattle. The fruit is cathartic and emetic, and in the form of powder is used as a snuff in jaundice, while the juice of the roasted young fruit is applied to the temples to cure headache.

Luffa Bindaal, *Roxburgh*, is regarded in Northern India as a powerful remedy in dropsy, and Luffa echinata, *Roxburgh*, is stated by Dymock to be employed in India as a remedy for colic, for cholera and for snake bite, the bitter fibrous contents of the fruit, which is of the size of a nutmeg, being given in substance or in the form of infusion.

Bentham and Hooker recognize ten species of the genus Luffa, of which only one is indigenous to America. However, in addition to Luffa acutangula, mentioned above, several other American plants are at least closely related to the same genus. For instance, Momordica operculata, *Linné*, is regarded by Grisebach as a variety of Momordica Charantia, *Linné*, and is Luffa operculata, *Cogniaux*, and of other botanists; in Brazil it is known as *buchinha*, the fruit being used for its powerful hydragogue cathartic properties. (See AMER. JOUR. PHAR., 1830, p. 144, 1884, p. 623.)

The fruit of the Egyptian luffa was chemically examined by R. J.

Weber (AMER. JOUR. PHAR., 1884, p. 7), who determined the presence of tannin, a little yellow coloring matter, a small quantity of bitter extractive, chlorophyll, and much bassorin-like mucilage. A chemical investigation of the bitter species of Luffa does not appear to have been made; but it is very likely that the bitter constituent represents the diuretic, cathartic and emetic properties, for which many plants of the order of Cucurbitaceæ are noted.

NOTES ON SOME OLD REMEDIES.[1]

BY JOHN M. MAISCH.

It is well known that many remedies, being in the course of time replaced by others, fall into disuse, sometimes for a long period, until, through accident or from other causes, they again attract the attention of physicians and are released from obscurity, either to find an apparently permanent place among officinal drugs, or soon to be consigned again among the obsolete articles. Such reintroductions of old remedies are frequently heralded as new discoveries, and, in some cases, such a claim holds good for special therapeutic applications, or for the chemical and physiological investigation of the active constituents. In most cases it will be at least of interest, from time to time, to collect recent statements or observations on remedies which were used by our forefathers, and for this reason the following brief record of the recent use of more or less forgotten medicinal plants is made.

Potentilla canadensis, Linné, popularly known as cinquefoil, five-finger or dry strawberry, and common in grassy places throughout a great portion of North America, was employed over a hundred years ago as a vulnerary and as an astringent, in diarrhœa and hemorrhages, both internally and as a gargle. More recently it was lauded in chronic catarrhs, in gonorrhœa, and as a powerful sudorific (see AMER. JOUR. PHAR., 1875, p. 111); and during the past year (*Therap. Gaz.*, Aug., 1887), Dr. Sansom Pope, of South Carolina, stated it to be a reliable remedy for night-sweats, an infusion of the entire plant being taken *ad libitum*, and that it is in use among the negroes as a domestic remedy.

Capsella Bursa-pastoris, Mœnch, is known as shepherd's purse, and has established itself in most countries as a weed in fields and in waste

[1] Read before the Pennsylvania Pharmaceutical Association at Titusville, June 13.

and grassy places. For a long time it was employed, boiled in red wine, as a styptic in hemorrhages of various kinds, a use which has recently been revived in Europe. Formerly it also enjoyed some reputation as a remedy for gonorrhœa and for intermittent fever. Among its constituents are little volatile oil, identical with that of black mustard, a little bitter extractive, some resinous matter, and *bursic acid*, the latter having been recently prepared by Bombelon as an amorphous mass, which appears to be a glucoside. An interesting paper by Prof. Dr. Husemann, giving the medical history of this plant, has been published in *Pharmaceutische Zeitung*, 1888, p. 151.

Reseda luteola, Linné, called dyer's weed or weld, is a native of Europe, and occasionally found growing spontaneously in the Atlantic states of North America. Both the bitter herb and the pungent root, the latter having a raddish-like odor, were formerly valued for their diuretic and sudorific properties. A notice in *Journal de Médecine de Paris*, Feb. 5, 1888, states that reseda has a great reputation among the people of Russia as a tænicide, a strong infusion of the dried flowers being used, followed by a dose of castor oil. The species not being given, it is uncertain whether the indigenous (in Russia) species mentioned above is intended, or whether the notice refers to the flowers of the North African species, *Reseda odorata*, the well-known mignonette, which is cultivated every where for its sweet perfume, and was medicinally employed by the Romans (Plinius, lib. xxvii).

Ribes nigrum, Linné, the black currant of our gardens, is indigenous to Europe and Northern Asia. All parts of the shrub possess an unpleasant odor, and were formerly employed for their diuretic and sudorific properties, and were valued as an alexipharmic. While the fruit, owing to its repulsive odor, is not relished, its expressed juice, after being fermented and aromatized with nutmeg, cinnamon, and other spices, has a delicate odor and very pleasant taste. This liquor, which is known in France as *cassis*, contains about 22 per cent. of alcohol, and has recently been recommended by Ferd. Vigier (*Jour. de Méd. de Paris*, March 25, 1888, p. 520), as a vehicle for many unpleasant remedies: the following formulas will illustrate its uses:

Chlorhydro-pepsic Elixir. Dissolve pepsin 0·40 gm. (or gr. vi) in water 8 gm. (or ℥ii) and hydrochloric acid 0·20 gm. (gtt. v); filter and add cassis 8 gm. (℥ij) and syrup 4 gm. (℥i). Dose, a wineglassfull after each meal.

Elixir of terpin. Terpin 0·50 gm. (gr. vij ss); alcohol and glycerin, of each 6 gm. (℥jss); cassis 8 gm. (℥ij); vanillin 0·005 gm. (¹⁄₁₂ gr.). Dose, a wine-glassful 3 or 4 times a day.

Wine of cinchona. Extract of cinchona 1 gm. (gr. xv), cassis 12 gm. (℥iij); good wine 7 gm. Dose, a wine-glassful at each meal.

Cassis is also said to be well adapted for the preparation of elixirs of calumba, coca, chloral, etc.

Our indigenous black currant, Ribes floridum, *L'Heritier,* has the smell and flavor of the cultivated species, and while it is probably equally effective as the latter, its fruit could doubtless be used for making an aromatic wine similar to the French cassis.

Cytisus Laburnum, Linné, is indigenous to Southern Europe, and is cultivated as an ornamental shrub under the names of *golden chain* and *bean-trefoil,* the large pendulous racemes of golden-yellow flowers being very showy. The purgative and emetic properties of the leaves and seeds are known in Europe, and particularly the seeds have been to some extent employed in medicine. J. L. Prévost and Paul Binet have been studying, for some time, the physiological effects of the flowers, the green fruit and the seed (*Jour. de Méd. de Paris,* January, 1888, p. 48). The aqueous extract of the seed was found to be more effective than the alcoholic extract. They consider the drug to be a good emetic, acting rapidly and better by hypodermic injection than when administered internally; and state that in large doses, besides the emetic action, paralytic effects are produced closely resembling those following the use of curare.

Of medicinal plants not growing wild or under cultivation in the United States, the following may be mentioned as having attracted renewed attention recently:

Humiria floribunda, Martius, a tree indigenous to Brazil, yields a pale yellow balsamic exudation which is used there like copaiba, as a substitute for which it has been again suggested in Europe. Humiria balsamifera, *Aublet,* of Guiana, yields a reddish balsam and resin, with a storax-like odor, and employed like that balsam.

Acalypha indica, Linné, is used in India as an anthelmintic, a decoction of the leaves, to which a little garlic is added, being employed. The expressed juice of the plant, mixed with oil, has the reputation of being an excellent liniment in arthritic and syphilitic affections.

Acalypha betulina, Retzius. The leaves have an agreeable odor, and

are employed in dyspepsia and in cholera. Our indigenous species of Acalypha do not appear to have been used medicinally.

Syzygium Jambolanum, DeCand., the jambolana or jambul of tropical countries, was referred to in a paper read before this Association in 1882, (Proceedings, p. 155, AM. JOUR. PHAR., 1882, p. 351). It was recently reported by Dr. J. Munday (*Brit. Med. Jour.*), to be of service in diabetes, in greatly reducing the quantity of urine, though it does not seem to affect the percentage of sugar secreted. One seed is taken thrice daily; the diminution of urine takes place within two days.

Schinus Molle, Linné, is a large tree of South America; its bark, leaves, fruit and exudation are medicinally employed. The fruit, which was recently sent to the London market on speculation (*Phar. Jour. and Trans.*, Dec. 3, 1887), is of the size of a pea and is remarkable for the striking resemblance in flavor to a mixture of pepper and fennel, and also has a slight bitterness and acridity. It has been used with success in gonorrhœa by Léotard (*Les nouv. Remèdes*, Nov. 27, 1887), and by E. Bertherand (*Jour. de Méd. de Paris*, March 4, 1888), and is given in the form of confection, the fruit being deprived of its reddish pericarp, then finely powdered and mixed with a small quantity of syrup of gum, whereby the odor and taste are sufficiently masked. The powder may also be made into pills. The tonic effects of the schinus fruit give it a great superiority to cubebs.

Hydrocotyle asiatica, Linné, the Indian pennywort, has been studied physiologically and therapeutically by Dr. C. Daruty de Grandpré (*Les nouv. Remèdes*, April 8, 1888). In small doses it acts as an energetic stimulant, its effects being chiefly directed to the cutaneous system; hence its usefulness in various skin diseases. In large doses it is narcotic, producing stupor, headache, and in some persons vertigo with a tendency to coma.

Gymnema sylvestre, R. Brown, a twining asclepiadaceous shrub, indigenous to India, is regarded there as a remedy against the poison of serpents. In a paper read before the Nilgherry Natural History Society, at Otacamund, David Hooper called attention to the curious property of the leaves upon the sense of taste. They are bitterish, astringent and acidulous. After chewing one or two of the leaves, the sweetness of sugar is not noticed, and quinine tastes like chalk. The effect seems to last for several hours, and is apparently due to *gymnemic acid*, which somewhat resembles chrysophanic acid. The taste of sour, saline and astringent substances is not materially altered.

Embelia Ribes, Burmann, belongs to the order Myrsinaceæ, and grows in Silhet where the berries have long been used for the adulteration of black pepper which they closely resemble in appearance, and to some extent in flavor. Dymock, in his work on the Materia Medica of India, states that they are efficacious against tapeworm, and form the principal ingredient of several patent medicines. G. H. Harris confirms (*The Lancet*) their efficacy for the complaint stated. The remedy is given, powdered, in doses of two to three drachms with milk or with curds early in the morning, fasting, and some hours later is followed with a purgative, like castor oil.

Siegesbeckia orientalis, Linné, order Compositæ, is widely distributed throughout Southern and Eastern Asia, where the bitter balsamic herb enjoys a reputation in dysuria and other complaints of the urinary organs. Dr. J. Hutchinson, of Glasgow, reports (*Brit. Med. Jour.*) his success in different forms of ringworm with the internal use of a syrup, prepared from the expressed juice of the plant; a liniment composed of equal parts of tincture of siegesbeckia and glycerin was employed externally. The drug appears to act both as a stimulant and parasiticide.

Several of the remedies enumerated above seem to deserve closer study on the part of pharmacists and physicians. Very few, if any, of them are likely to be honored in the future by a place in our national Pharmacopœia. Still, even this distinction may be supposed to be in waiting for a larger number, when it is remembered that in the last edition such previously discarded plants, like Calendula and Chelidonium, were again admitted.

The Haya Poison.—An arrow poison called Haya, has been examined for Messrs. Christy and Co., of London, by Dr. Lewin, of Berlin, and was found by him to consist of a substance identical with, or allied physiologically to erythrophlœin, a substance which, he thinks, acts as a local anæsthetic. But Tweedy, in a letter to the *Lancet* (February 4th, 1888, p. 249), denies that erythrophlœin produces anæsthesia, and Liebreich (*Deutsche Med. Wochenschrift,* Feb. 16, 1888) casts doubt on the inferences which Lewin has drawn from his experiments. He considers that Haya is probably a form of serpent poison, and hence, as Lewin found, acts more powerfully when injected subcutaneously than when taken by the mouth. The erythrophlœum bark found in the poison, Liebreich thinks, is probably simply an impurity. Lewin says that a paper which is about to appear in *Virchow's Archiv* will show many of Liebreich's objections to be groundless.—*Med. Chronicle,* March 1888.

REFERENCE TABLE OF DOSES.[1]

By Joseph W. England, Ph. G.

Without doubt one of the greatest needs in the coming revision of our national guide-book on Pharmacy—the U. S. Pharmacopœia—is the presence of a carefully constructed table of doses founded upon a general average of different authorities.

Authorities vary greatly in their statements of dosage. Indeed, it is almost impossible to find two who exactly agree in any large number of drugs, so that the physician and the pharmacist, on reference to them for information, are often exceedingly puzzled as to which of the conflicting and widely varying statements to accept.

Whilst this need is an undeniable one, the expediency of inserting doses in the Pharmacopœia is questioned. The main arguments urged are, that it would make the work authoritative in that direction, bring it into courts as evidence, and subject it to endless fault-finding; and the case of the British Pharmacopœia, which, in the last issue, inserted the dose with each drug, is cited as evidence in support of these assertions. The first claim is no argument at all. The great need for authoritative decisions on this subject is ample warrant for our Revision Committee to assume that responsibility, in addition to other equally responsible ones which they have assumed and discharged satisfactorily in the past. The argument that it would invite adverse criticism is fallacious, as is evidenced by the experiences of our Dispensatories, which, whilst they do not give tables, devote considerable space under each drug to statements concerning its dosage.

Relative to the insertion of doses in the British Pharmacopœia, the reason for their failure to meet popular approval seems much more probably resident in the method of dosage expression and lack of accuracy, than in the fact of their insertion, as may be evidenced by a critical examination of that work. For example, the dose of the officinal quinine salts is stated to be from 1 to 10 grains, whilst here tonic doses are 1–3–5 grains, and antipyretically used, 5–15, and even 30 grains is nothing unusual. Strychnine is stated to be from the $\frac{1}{30}$th to the $\frac{1}{12}$th of a grain, whilst the range is much more generally from the $\frac{1}{64}$th to the $\frac{1}{32}$d to the $\frac{1}{24}$th of a grain; maximum, $\frac{1}{24}$th to $\frac{1}{18}$th to $\frac{1}{12}$th of a grain.

[1] Read before the Pennsylvania Pharmaceutical Association at Titusville, June 13.

Potassium bromide is given as from 5 to 30 grains, yet it ranges as a sedative, from 10-20-30 grains and, as a hypnotic, from 30 to 60 grains at a dose.

Potassium iodide is stated to be from 2 to 20 grains, while we use from 5-15-30 grains as an alterative, and 30-45-60 grains as an antisyphilitic.

Hydrobromic acid is given as from 15-50 minims, should be ½ to 2 fluid drachms; maximum, 2 to 4 fluid drachms.

Hydrocyanic acid is made 3-8 minims (!) The range is 1 to 3 minims, maximum dose 3 to 5 minims.

Benzoic acid 10 to 15 grains. Our doses 10 to 15 to 30 grains.

Bismuth subnitrate is expressed as from 5-20 grains, should be from 10 to 30 to 60 grains.

Caffeine citrate as 2 to 10 grains. It is much more generally given in 1 to 3 grain doses, maximum 3 to 5 grains.

Cinchonine and *Cinchonidine salts* as 1 to 10 grains, should be 3 to 5-10 grains as tonic doses, and, antipyretically used, as 10-20-30 grains.

Lastly, under *Donovan's solution* we find the dose given as from 10 to 30 minims, which is equal to $\frac{1}{6}$ to $\frac{1}{3}$ of a grain, each, of arsenic and mercuric iodides (!)

These familiar examples amply suffice to show the general lack of accuracy, and most probably explain the reason of the British Pharmacopœia's failure of its dosage feature.

The German Pharmacopœia, in its "Table of Maximum Doses,"[1], is better, in some respects, than the British, but is not as good in others, while the Belgian Pharmacopœia seems to be the best of the three. The French Codex, with one or two exceptions, gives no doses. As a criticism of these works would follow largely in the same direction, it is omitted.

The point has also been raised, that if doses are inserted in the Pharmacopœia, that, being authoritative, it would make the dose of each drug so fixed and absolute that physicians could not venture beyond maximum limits without laying themselves open to serious questioning and criticisms, and possibly lawsuits.

Naturally, with this aspect of the case kept alone in view, physicians would most justly resent any limitation whatever in doses, whilst battling oft-times for life itself. But any possible contingency of this sort could readily be obviated by framing the dose table on a graded

[1] National Dispensatory, 3rd edit., p. 1643.

scale, with the ordinary minimum, medium and maximum doses, and refusing absolutely to allow it to be considered as a fixed, inviolable standard, giving it, simply, as an expression of the *ordinary* quantity administrable at a single dose of certain drugs.

The accompanying alphabetically arranged table comprises a list of over 500 of the more important officinal and unofficinal pharmaceutical drugs and preparations, which have found employment in the wards of the Philadelphia Hospital, and is the table of reference there used by the Drug Department.

The doses are given in apothecaries measure, and are graded as minimum, medium, and medio-maximum doses, followed by (in the case of the more active remedies) the APPROXIMATE maximum limits; as the absolute quantity of a drug in a given case to effect a full physiological action, being varied by so many conditions on the part of the patient, can only be determined in each instance by the attending physician. The doses are those of adults. Those for an age of less than twenty four years and more than twelve years can readily be calculated by taking the number of the age as the numerator, twenty-four as the denominator and working out the value of the fraction. In cases of less than twelve years, Young's admirable rule of making the age the numerator, and the age plus twelve the denominator and working out the value of the fraction, is amply sufficient for all practical purposes.

The doses herein given are understood to be administered by the mouth. In administration hypodermically, the *general* rule is to make the dose three fourths that of the mouth dose, whilst, rectally, the method followed, is to make the dose one and one-fourth that of the mouth dose.

In all cases where the dose reaches maximum limits, the rule observed by us (unless the dose is especially marked or underscored, and even then where there is a too great frequency of dose,) is to have a personal interview with the physician, prior to compounding the prescription, so that he shall assume full responsibility. It is understood, of course, that where officinal preparations are named the standard of strength is that of our present Pharmacopœia. (U. S. P. 1880).

(*To be concluded in the next number.*)

Liniment of methylal is recommended to be made of methylal 15 parts and expressed almond oil, 85 parts.—*Amer. Jour. Med. Sci.*, April, 1888.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for THE AMERICAN JOURNAL OF PHARMACY.

RAPID PREPARATION OF MERCURIAL OINTMENT.—A quick and easy method is proposed by Jacquemaire, *J. de ph. et de chim.*, May 15, 1888, who uses in the process 1 part of potassium or sodium (the former preferred), to 1000 parts of mercury. There is no modification of the metal, and the lard is but slightly saponified. The mercury should be heated to dryness and the potassium added in small fragments while stirring; a slight crackling denotes the desired change and the mass is then poured into a mortar containing the lard, where it is rapidly beaten. The mercury becomes fully absorbed, even in large quantities, in about ten minutes.

A NEW OXYGEN COMPOUND FROM SULPHUR.—At a meeting of the Paris *Société de Pharmacie* (May 2), Mr. Villiers said that he had introduced sulphurous acid into a well closed phial containing crystals of hyposulphite of sodium and remarked 48 hours afterward that the acid had been absorbed. The operation was repeated until absorption ended. He then found that he had two salts, one of trithionate of sodium, and one of soda with a new acid. In the air the trithionate effloresced; the other crystals were gathered and recrystallized. This sodic salt is stable; the acid has not yet been isolated. *Arch. de phar.*, June 5, 1888.

SULPHATE OF ZINC—ITS DANGEROUS ACIDITY.—This salt—in common with other combinations of strong acids with weak bases—usually gives an acid reaction. It is very largely used in ophthalmology. A Belgian druggist barely escaped a suit some time since for having dispensed it knowing that it contained free acid. In fact, the processes of manufacture consist in saturating dilute sulphuric with zinc oxide or metallic zinc, and, after evaporation, to add acid, to prevent the formation of a basic salt. Professor Gille instructs his scholars in pharmacy to treat the compound as follows: Dissolve 50 cgm. of sulphate of zinc in 50 gm. of distilled water. Take a glass rod, wet with ammonia, and place it in contact with the surface of the solution. A clouded zone is produced by the hydrated zinc oxide which has been freed by the ammonia. Agitation of the solution causes a persistence of the cloudiness if the sulphate is pure; but the liquid becomes limpid if there is free acid present. The solution must be dilute, otherwise a soluble basic sulphate forms with the zinc

hydrate, and this might be a cause of error. When the quantity of free acid passes a certain limit the hydric sulphide loses the power of clouding the solution—a confirmation of the presence of free acid. The principle here applied may, with appropriate modifications, be made very useful in the laboratory for composites which, when pure, give acid or basic reactions.—*J. de Phar. d' Anvers; Bull. Comm.*, May, 1888.

NEUTRALIZATION OF POISONS.—At the sitting of May 12th, *Société de Biologie*, Mr. Roger communicated the results of experiments to discover if a mortal dose of a toxic substance is modified by the simultaneous introduction of another toxic substance. He used morphine, atropine, quinine and chloride of potassium. He first learned the "toxic equivalents" of each substance when injected hypodermically, and then used the bodies, two at a time. Mixtures of atropine and morphine caused death much sooner than the toxic equivalent of either. The same was the case with mixtures of atropine and quinine, and of quinine and morphine. In all cases the two substances acted synergically, and their toxic powers increased by exact progression. Mixtures of chloride of potassium and quinine had nearly twice the toxic energy indicated beforehand by their components. When the potassic salt is united to morphine each substance acts as if isolated, and the animal succumbs after receiving a mortal dose of either. Save in the latter instance the action of toxic substances when mixed two by two, is in accordance with the sum of their toxic power. In no case was there observed a toxic antagonism, that is to say, the more or less complete neutralization of one poison by another.—*Le Progrès méd.*, May 19th, 1888.

COMPARISON OF ANTIPYRINE AND ACETANILIDE WITH SOLANINE.—In a long and carefully prepared communication to the *Congrès d'Oran*, Dr. G. Sarda arrives at the following conclusions: The three medicaments are excellent nervines. Antipyrine is superior to the others in primitive or secondary, acute, articular rheumatism, migraine, recent neuralgias and paroxysmal pains. Antipyrine and acetanilide act in about the same way [*i. e.* they ameliorate. Trans.] in neuralgias of long standing and in motor excitation. Solanine is an excellent analgesic. Although inferior to the other two drugs in combating acute, articular rheumatism, it appears to be superior in old neuralgias. It calms gastric, ataxic and lancinating pains. It is an

excellent calmative for the phenomena of motor excitation—superior in this respect to acetanilide. It brings about a very rapid disappearance of the tremors of lamellated sclerosis, and controls exaggerated reflexes, and epileptoid trepidation. It appears to act with most certainty in cases of sensitive or motor phenomena dependent upon anatomical alterations. Judging from the cases cited by Dr. Sarda, an average amount to give per diem of acetanilide would be 2 gm.; and of antipyrine 3 gm. (he calls 4 gm. an elevated dose). The average quantity of solanine to be taken daily is distinctly stated to be 25 or 30 cgm. Toleration, he says, is perfect. *Bull. gén. de thérap.*, May 30, 1888.

MECO-NARCEINE.—At the *Acad. de Méd.*, May 29, Laborde stated in his own name, and that of Duquesnel, that they have obtained from morphine a pure, true, crystallized narceine, and an amorphous product wholly disconnected from morphine and the spasmodic alkaloids. Constantin Paul remarked that narceine exists only in minute quantities in opium, that it is almost inert, and that it does not become active except it be associated with other alkaloids of opium still undetermined.—*Le Prog. méd.*, June 2, 1888.

TARTRATE AND SALICYLATE OF QUINOLINE are recommended by Skraup (*Gior. di farm. sper.*), as being excellent for surgical dressings on account of their great antiseptic powers and easy solubility. The author says that the solutions are more active than those of zinc, silver or permanganate of potash. His formula for a gargle is: Quinoline, 1 gm.; alcohol, 90 per cent., 50 gm.; aqua menth., 500 gm.; ol. menth., gtt 2. An injection for blenorrhagia is as follows: Quinoline tartrat., 1 gm.; aq. dest., 150 gm.—*Nouv. Rem.*, May 24, 1888.

HELLEBOREIN AS A LOCAL ANÆSTHETIC. As a result of experiments with animals, Venturini and Gasparini conclude that greatly diluted solutions of helleborein induce complete corneal anæsthesia without irritations of any kind. The effect of a single application continued undiminished for half an hour; three light applications produced anæsthesia lasting for twenty-four hours; three or four drops of a solution containing $\frac{1}{2}$ mgm. to each drop, caused corneal anæsthesia in dogs to such a degree that perforation with pins was made within fifteen minutes and caused no expression of pain. It is to be noted that the authors refer to "a very energetic cardo-toxic action" as be-

ing one of the characteristics of this substance. *Nouv. Rem.*, May 24th, 1888.

STROPHANTHUS AS A DIURETIC. Dr. Lemoine stated to the *Société de Biologie*, May 26, that from clinical and experimental researches he had found strophanthus to be a powerful diuretic which, in elevated doses, would easily induce albuminuria. *Le Prog. méd.*, June 2, 1888.

OLEUM ROSÆ.—In a paper by Bonkowski Bey, the sultan's chemist, the percentage of the product obtained from a given number of roses is definitely stated. It has been hitherto considered a manufacturers' secret. The number of roses required for one ocque (1284 gm.) of distilled rose-water of good quality is given at 700. About 3000 kilogm. of roses are required to make one kilogm. of the oil. By hurrying the distillation, 1 kilogm. of oil may be had from 2,500 kilogm. of flowers, but the oil is not so fine as the first.—*Rev. méd. phar.*, Constantinople; *Arch. de phar.*, June 5, 1888.

BATJENTJOR, BATIATIOR, OR VERNONIA NIGRITIANA.—Heckel and Schlagdenhauffen (*Compt. Rend.; Acad. Sci.*, May 14, 1888) describe the plant as indigenous in parts of Western Africa, where the root is sold as a febrifuge. Emetic properties are attributed to it, though the authors do not find emetine; indeed, they find no alkaloid in it, only a glucoside, which they name *vernonin*, and which decomposes into glucose and a resin insoluble in water and weak acids. The glucoside appears as a slightly hygroscopic white powder, having a yellow tint in solution. It is slightly soluble in ether and chloroform; with sulphuric acid it turns brown, and then violet-purple. The resin gives the same coloration with sulphuric acid. Injected under the skin of the frog, in doses of "a few centigrammes," vernonin arrests the movements of the heart. Its action may be compared to that of digitalis, but it is "twenty-four times less strong than digitalin."—*Arch. de phar.*, June 5, 1888.

MEDICINAL PLANTS OF ALGERIA.—At the Congress of the *Association Française pour l'avancement des Sciences*, Mr. Bertherand of Algiers mentions a number of plants which that province offers to the Pharmacopœia, among them the following: Arabian fraham (*Aceras anthrophora*) gives good results as a sudorific and a stimulant. Arabian taubra (*Globularia Alypum*) is the usual purgative of the natives;

it is given in doses of from 20 to 25 gm. in decoction. Eucalyptus is well known by its prophylactic influence over intermittents. *Arenaria rubra* is used for gravel and vesical catarrh. Date shells are employed as an aliment and as a styptic in certain cases of atonic diarrhœa. Lantana is rich in essential oils and is used in sitz baths for the acute colics of dysmenorrhœa; also for anæmia. For mucopurulent, vaginal discharges it is used as an injection. Schinus Molle is used for making preparations for curing blenorrhagia. Finally, gazelle's musk is used as a substitute for that of the deer.—*Bulletin gén. de thérap.*, May 15, 1888.

CITRATE OF IRON AND STRYCHNINE.

By Dr. E. R. Squibb.

The Pharmacopœia of 1870, yielding to the popular demand for ready-made arbitrary combinations, introduced the citrate of iron and strychnine, and the present revision retained it, adding a very good paragraph of description and tests.

The preparation is a simple mixture of citrate of iron and ammonium with citrate of strychnine—or of an iron salt with a strychnine salt, without any known advantage, but with the rational disadvantage of a fixed relation between two agents which are rarely needed in the same proportion or for the same length of time in any two cases.

Its usage seems to depend upon its convenience to those physicians who prefer to have the proportions of their agents fixed for them beforehand. The original intention of the mixture was, doubtless, that it should be given in the solid condition, in powder, pill or capsule, but of late it has become common to give it in solution, and it is the object of this note to state that it is not permanent in solution.

When made in strict accordance with the U. S. P. process a whitish deposit will begin to settle out within two or three hours, and will continue to increase at the bottom of the solution during many days. A slight increase in the proportion of ammonia or of citrate of ammonia will retard the decomposition for a short time, and will redissolve the precipitate when formed, and in this way it may be made to stand about a day or two longer for each 2 per cent. of citrate of ammonia added to replace as much citrate of iron and ammonia, but no proportion tried has rendered the solutions permanent for a longer

time than three or four days when the proportion of strychnine is kept at 1 per cent. The precipitate in every case was about 50 per cent. strychnine, and any patient who should get the last doses from a vial that had not been well shaken at every dose, would be surely poisoned by the strychnine; not fatally of course, because if the precipitate was all strychnine and if all the strychnine was deposited, it would require 50 to 100 grains to yield a fatal dose. Yet the effects might be alarming and troublesome.—*Ephemeris*, III, page 1128.

THE KEEPING QUALITIES OF SPIRITUS ÆTHERIS NITROSI, B. P.

By John C. Hunter.

From time to time, during the last two years, statements have appeared in the Journal as to the results of analyses of spiritus ætheris nitrosi by various experimenters, and have been generally to the effect that samples of that preparation, obtained from various wholesale houses, varied greatly in the amount of nitric oxide given off upon the decomposition of the nitrous ether in them, and further that samples which may have been of standard strength when first bought gave off upon testing them after several months had elapsed a less amount of nitric oxide, showing that the amount of nitrous ether in them had diminished.

Wishing to determine the amount of deterioration attending the ordinary routine of the retail sale of spirit of nitrous ether, I made half a gallon on March 10, 1887, and, on testing the product, found it to give off 7 vols. of nitric oxide at standard temperature and pressure. A portion was filled into the front shop bottle and the remainder tightly corked and put into a cool press away from the light.

On April 25, the contents of the shop bottle were tested and found to give off 5·6 vols. of nitric oxide. The stock bottle was tested at the same time, and found to give off 6·766 vols. of nitric oxide. On July 28, both bottles were again tested, when the shop bottle gave off 5·4 vols. nitric oxide and the stock bottle gave off 6·7 vols. The shop bottle at this time was refilled from the stock bottle. The latter was recorked and not opened again until Decem-

ber 28, when it was found to give off 6·12 vols. of nitric oxide. The shop bottle, being tested on the same date, was found to give off 3·8 vols.

On December 28, the shop bottle was filled up with the last of the half-gallon, and the preparation was finally tested on March 22, 1888, when it was almost sold out, there being only 2 ozs. left, and it was found to give off 3·4 vols. of nitric oxide.

From the foregoing results it appears that in the daily sale of spiritus ætheris nitrosi, B.P., there is a gradual loss of nitrous ether going on; but where the stock bottle is well stoppered and kept in a cool dark place, the decomposition of the nitrous ether is much slower than would appear from the statements of some experimenters; for beginning with spiritus ætheris nitrosi giving off 7 vols. of nitric oxide on March 10, 1887, it was found on December 28 to still yield 6·12 vols., which showed a loss of only 0·88 vol. in 10 months and 18 days.

Again, the preparation in the retail bottle gave off 3·4 vols. of nitric oxide on March 22, 1888; this showed a loss of 3·6 vols. of nitric oxide after it had been in daily use for 12 months and 12 days. From that may be deduced the fact that provided the dispensing chemist has his spiritus ætheris nitrosi, B.P., of standard strength to begin with, and does not keep it more than twelve months, it will never fall so low in nitrous ether as to give off only $\frac{1}{10}$ vol. to 1 vol. of nitric oxide, the quantity stated in some of the prosecution cases under the Sale of Food and Drugs Act.

In conclusion, every dispensing chemist, if he does not possess an Allen's nitrometer should test his spiritus ætheris nitrosi when bought from his wholesale house, if he does not make it himself, either by Mr. Proctor's method, as described in the *Pharmaceutical Journal*, (Feb. 19, 1887, p. 699), or by Mr. Blunt's syringe nitrometer (*Pharm. Jour.*, March 19, 1887, p. 763), for by so doing he could easily refuse to retain it if it did not give off 5 vols. of nitric oxide.—*Phar. Jour. and Trans.*, June 9, 1888, p. 1027.

Copaiba in Croup is recommended by Dr. P. H. Thompson, Bluffton, Ga. (*Med. and Surg. Rep.*), who uses a four ounce emulsion of copaiba 1 oz., containing also 1 oz. of syrup of squill. The dose is a teaspoonful every two hours, or less frequently, according to circumstances.

NOTES ON INCOMPATIBILITIES IN PRESCRIPTIONS.[1]

By H. Campbell, Pharmaceutical Chemist.

The author said that some persons consider that all drugs which react chemically are incompatible, and, therefore, are led to condemn mixtures of tinct. hyoscyami with liquor potassæ, of liq. ferri perchlor. with glycerin, of quinine sulphate with alkalies, or of liq. plumbi subacet. with tinct. opii. But probably all present had dispensed such combinations to the entire satisfaction of the prescribers. In dealing, however, with presumably incompatible prescriptions, it was necessary, generally speaking, to rely on the following rules:

1st. If any dangerous decomposition may be expected to occur after the medicine has left the dispenser, some precaution should be taken to obviate such danger, and in most cases that precaution would take the form of a warning to the prescriber.

2d. To dilute the suspected ingredients before mixing, or, in the language of the dispensing counter, "to keep them apart as far as possible."

3d. To mix them cold.

4th. When strictly necessary, to use mucilage (preferably that of tragacanth) in order to retard decomposition, or to suspend a precipitate.

In a paper read before a medical society, the following mixture had been condemned on the ground that as the first two ingredients form a well-known alkaloidal precipitant, a compound containing most of the mercury will fall, and be taken in the last dose:—

℞ Liq. hyd. perchlor.	♏ 10
Potass. iodid	gr. 10
Dec. cinchon	ad ℥j

If, however, the mixture were dispensed according to the second rule, the precipitate was so readily diffusible and, after shaking, remained suspended so long, that the patient had plenty of time to pour out a dose; but, of course, he should be directed to "shake the bottle."

Again it is considered that liq. strychnine must not be combined with sodium bicarbonate, yet the following mixture had remained clear for weeks:—

℞ Liq. strychnine	♏ 5
Sodii bicarb.	gr. 15
Aq. ad	℥j

[1] Abstract of a paper read before the Midland Counties Chemists' Association; reprinted from *Phar. Jour. and Trans.*, May 12.

The dose of liq. strychninæ would contain $\frac{1}{12}$ grain of alkaloid, forming in the ounce mixture a solution of the strength of 1 in 9600, while the solubility of the alkaloid in water is about 1 in 5700.

Potassium iodide also was sometimes considered to be incompatible with strychnine. In a case where five grains of the former were prescribed in an ounce of water with doses of liquor strychninæ gradually increased from 5 mimims to 30 mimims, no precipitation occurred until more than 20 mimims of the liquor were used, and even then, by adding one drachm of mucil. tragacanth to each dose, precipitation was so retarded that by only preparing sufficient medicine at a time to last one day the patient took it with safety. But in another case, where 10 grains of the iodide were mixed with 20 mimims of the liq. strychninæ in an ounce of water, needle-like crystals appeared in twelve hours. This result was found to be due to the slight alkalinity (allowed by the British Pharmacopœia) of the iodide, for when the salt was slightly acidulated with acid hydrochlor., before adding the liq. strychninæ, no crystals appeared for four days, and then in comparatively small quantity.

Another favorite combination is:—

℞ Liq. hyd. perchlor..... ℥j
Ammon. carb.
Pot. iodid..... āā gr. 5
Aq. ad ..... ℥j.

Although alkaline carbonates precipitate with mercuric chloride, still, if in the above mixture the first and third ingredients are mixed and the carbonate then added in solution, no precipitate occurs, even after a month has elapsed. If common water be used a slight precipitate of calcium carbonate forms, but it is free from mercury.

Tannic acid is said to be incompatible with mineral acids. It is true that a concentrated solution gives a white precipitate with acid. sulph. dil., and that as tannin is a glucoside it is decomposed by boiling with dilute acids, yet, dispensed according to the second and third rules, the following mixture showed no obvious signs of decomposition:—

℞ Acid. tannici..... gr. 10
Ac. sulph. dil..... ♏ 15
Aq. ad ..... ℥j.

Tannin is considered incompatible with alkaloids, because in strong

solutions a dense precipitate occurs; but if the following be properly dispensed the precipitate is readily diffused on shaking:—

℞ Acid. tannici ..... gr. 5 (or 10)
Quin. sulph. ..... gr. ij
Acid. sulph. dil. ..... ♏ 3
Aq. ad. ..... ℥j.

Potassium bromide is considered incompatible with metallic salts, and certainly it was not always safe to mix the liq. ferri perchlor. of the B.P., 1887, with the bromide, but the 1885 liquor, being practically neutral, forms in the following prescription a mixture in which very little bromine is liberated—generally none at all—for on shaking the liquid with chloroform the latter is scarcely colored, if at all:—

℞ Liq. ferri perchlor. ..... ♏ 15
Pot. brom ..... gr. 20
Aq. ad. ..... ℥j.

AmBr and NaBr give similar results, still it would be wise in this case to observe the first rule.

In other instances "incompatibility" can be overcome by adding something to the prescription. In a case where "ear-drops" were to contain cocaine hydrochlorate with borax, the alkaloid was partially precipitated, but immediately redissolved by a trace of hydrochloric acid.

When alkalies are mixed with quinine sulphate the alkaloid is liberated, often in a sticky resinous form, but if the powdered alkaloidal salt be mixed with water and a proper quantity of tragacanth mucilage, and the alkali be then added in solution, a presentable mixture results.

Syr. ferri iodidi gives with potass. iodid. a precipitate of ferr*ous* quickly changing to ferr*ic* hydrate, because pot. iodid. is usually a little alkaline; but the addition of a little citric acid to the solution of the iodide will keep the mixture clear.

The author concluded by saying that when additions have to be made, the dispenser ought, if possible, to first obtain the sanction of the prescriber, and that in his experience such sanction had always been freely accorded; in fact, one very eminent London physician had said: "If I prescribe anything incompatible put the matter right for me, and drop me a postcard afterwards." Such a habit of dependence upon the special knowledge of the pharmacist was, he had reason to believe, becoming more and more general among the members of the medical profession; it was for pharmacists to prove themselves worthy of it.

PEPPER AND ITS ADULTERANTS.[1]

By E. Davies, F. C. S., F. I. C.

Mr. Davies said the plant which yielded the pepper of commerce was one of the Piperaceæ, *Piper nigrum* being a climbing plant bearing its flowers in spikes. The flowers were unconspicuous, and were succeeded by green drupes which became red when ripe. They were gathered before ripening and dried, the fleshy portion becoming wrinkled and black. When white pepper was to be made the berries were soaked in water, sometimes, it was said, in cow's urine, and the outer layer rubbed off. Black pepper was manufactured by grinding the whole of the dried grain; white pepper, on the other hand, by grinding the decorticated berry. To meet the demand for an exceedingly light colored pepper, the outer layers of the seed were sometimes ground off, and only the nearly white kernel was used. As the starch of which the berry was largely composed was largest in proportion in the centre, the pepper so made was deficient in pungency and flavor, and it was a nice question whether such treatment was allowable under the Food and Drugs Act. Nothing was indeed added, but the removal of the most valuable portion of the berry was akin to skimming milk. One of the constituents of pepper was an essential oil, which could be obtained by distilling crushed pepper with water. Of this black pepper yielded 1·17 per cent., and white pepper 1·04 per cent., and it had the smell of pepper but not a strong taste. Its composition was akin to turpentine. The perfume of pepper being largely due to it, to obtain the best result the pepper should be fresh ground, or kept tightly closed. The custom of keeping pepper in castors with perforated tops was unscientific. Little mills by which the pepper could be ground when required was the best method of obtaining it pure and pungent. Other constituents were a resin soluble in caustic potash, and piperine, an alkaloid, the amount of which was very variable. In black pepper, from a recent analysis, the percentage was 7.14 to 6.62, and in white pepper, 6·47. It was soluble in alcohol, and was said to be febrifugal, it being curious that its composition was identical with that of morphine. Other ingredients were starch, which in black pepper amounted to from 49 to 56 per cent. and in white pepper from 77 to 85 per cent., and cellulose, which in white pepper ranged from 12 to 14 per cent. and in black pepper

[1] Abstract of a paper read before the Liverpool Chemists' Association; reprinted from *Pharm. Jour. and Trans.*, May 26.

from 21 to 26 per cent. Under the head of impurities, Mr. Davies dealt first with the mineral ingredients of the ash. In black pepper this was generally due to impurities adhering externally to the pepper seed, but except where sweepings had been added ought never to amount to more than 6 or 7 per cent. Of vegetable adulteration, the first to which he called attention was long pepper, made from the wild plant *Chavica Roxburghii*, which belonged to the same natural order as pepper, and also contained piperine, but in much smaller quantity. The essential oil yielded by it was stronger in smell, and there could be no doubt of the injury caused to pepper by the admixture of even a small quantity of this product. Rice was added to pepper for two reasons: first, to improve the color by whitening it, and so gratifying the taste for white pepper, and secondly, to increase the bulk with a cheap adulterant. Fortunately the angular starch grains of rice, being twice the diameter of pepper starch, rendered its detection easy. Spent ginger, which had also been used, was likewise easily detected for the same reason. They would be well acquainted with the history of the ingenious adulteration known as pepperette or poivrette. The discovery of it by Dr. Campbell-Brown, and the publication by him of a method for its detection, had stopped what might have been a very successful swindle. The great advantage of this adulterant was that it contained no starch granules, and the cells which composed it were almost identical in form with those of the cortical layers of pepper. Only by careful comparison of the two under ordinary polarized light could they be distinguished. The olive stones from which the adulterant was made possessed neither pungency nor flavor. Under the microscope the centre of the cells of bleached pepper was light colored, like the centre of the cells of the ground olive stone; but when polarized light was used there was a difference in color, the olive cells being light bluish, and the pepper yellowish.

Strychnine as a hypnotic is recommended by Dr. Lander Brunton (*Practioner*, Jan. 1888,), in sleeplessness due to mental fatigue, caused by strain or worry, and is preferred to opium, chloral and bromides. Sleep comes readily to the tired, but not to those *over* tired, either with mental or bodily work. The stimulating effect of strychnine appears to convert the over tiredness which prevents sleep, into the simple tiredness which tends to it. Brunton has given 5—10 m. of tincture of nux vomica, or a granule or two containing $\frac{1}{100}$ gr. of strychnine, at bed time, the dose being repeated if the patient happen to wake within one or two hours.

EFFECTS OF FOOD-PRESERVATIVES ON THE ACTION OF DIASTASE.[1]

By Henry Leffmann and William Beam.

The use of antiseptics in perishable articles of food has become quite general in recent years, and has been, to a certain extent, the subject of legislation. Salicylic acid has been, probably, the most used, and while sanitary authorities of different countries have, as a rule, opposed its use, there has been no positive evidence of its injurious action, even when continued for some time. Lehmann published in Pettenkofer's "Archives of Hygiene" several instances in which healthy male adults had taken for many days considerable doses of this acid without apparent injury. While there may be a legitimate field for the use of the agents in articles of food of a highly perishable character, and especially where the addition is made known, there can be no question that their indiscriminate use is dangerous. Independently of any directly injurious action, it is important to inquire how far they may interfere with the nutritive or medicinal value of any article with which they may be associated. The matter has been brought prominently to our notice in consequence of some analyses made by us for the State Board of Health of Pennsylvania, in which the free use of salicylic acid in beers and malt extracts was detected. Similar results in regard to beers were found by other State Boards and the Department of Agriculture of the United States Government. It becomes important, then, to inquire how far the presence of these substances may interfere with the diastasic action ascribed to preparations of malt. It must be noted that with a number of the malt extracts now on the market the addition of a preservative has very little significance, because, as prepared, these articles are merely weak beers, and possess no diastasic power. Thus, of eleven samples tested, including all the extracts widely known in the market, only four had any appreciable effect, and but one of these was strikingly efficient.

We have undertaken a few experiments to determine what retarding effect the common food-preservatives may possess. The method of operating was that indicated by Drs. Duggan and Coale in papers in the *American Chemical Journal* and elsewhere, based on the estimation of the sugar formed in presence of a large excess of starch.

[1] Read at meeting of Public Analysts, London, May, 1888; reprinted from the *The Analyst*, June, p. 103.

Arrow-root starch was selected for reasons given by these observers. To avoid error due to varying action of the dilute solutions of malt which are required for the experiments, a blank experiment was made in each set, and from this the diastasic value of the pure malt extract was determined. In the first observations maltine was employed, it having been shown by our previous tests to be far the most active of the commercial extracts, but later Schuchardt's diastase was used. The Fehling's solution was prepared as directed by Allen, and the determinations were made volumetrically. Many of the experiments were duplicated, with concordant results. In addition, a number of tests were made by the method given by Allen for valuing malt-extracts. The results obtained were similar to those given below, but, not being capable of quantitative comparison, are not detailed here.

The antiseptics selected were salicylic acid, boric acid, sodium acid sulphite, saccharin, beta-naphthol, and alcohol. The sample of beta-naphthol was of the form now sold under the name hydronaphthol. In all the experiments the temperature, time of action, strength of starch solution (30 grammes to litre) were the same.

In the following table the effect is represented produced by 0.5 cc. of maltine diluted to 5 cc., and added to 100 cc. of starch solution. The figures give the proportion of antiseptic used to the whole volume of solution, and the amount of sugar formed from the starch—that contained in the maltine being deducted:

Antiseptic used.	Proportion.	Fehling's Solution required.
None		245 cc.
Salicylic acid	1 to 500	No sugar formed.
" "	1 " 1,000	" " "
" "	1 " 20,000	245 cc.
Boric acid	1 " 1,000	245 "
Sodium acid sulphite	1 " 1,000	245 "
Saccharin	1 " 1,000	18·5 "
"	1 " 500	5·6 "
Beta-naphthol	1 " 1,000	204 "
" "	1 " 500	174 "
Alcohol	1 " 25	245 "

In the above experiments the antiseptics were added to the starch and the maltine allowed to act at once. In the following, very small quantities of salicylic acid and alcohol were first mixed with *maltine* and allowed to stand four days before addition to the starch.

Antiseptic used.	Proportion.	Fehling's Solution required.
None		245 cc.
Salicylic acid	1 to 20,000	174 "
Alcohol	1 " 500	221 "
Salicylic acid Alcohol	1 " 20,000 1 " 500	174 "

As before, the proportion of antiseptic is given to the whole volume of solution, after addition of the starch.

EXPERIMENTS WITH DIASTASE.

Proportion of Diastase.	Antiseptic.	Proportion of Antiseptic	Fehling's Solution required.
1 to 500	None		300·5 cc.
1 " 500	Salicylic acid	1 to 3,000	286 "
1 " 500	" "	1 " 1,500	16 "
1 " 500	" "	1 " 1,000	No sugar.
1 " 1,000	None		263 cc.
1 " 1,000	Salicylic acid	1 " 1,000	No sugar
1 " 2,000	None		283 cc.
1 " 2,000	Salicylic acid	1 " 5,000	82 "
1 " 2,000	" "	1 " 3,000	No sugar
1 " 1,000	Boric acid	1 " 1,000	250 cc.
1 " 1,000	Sodium acid sulphite	1 " 1,000	263 "
1 " 500	Saccharin	1 " 1,000	86·3 "
1 " 1,000	"	1 " 1,000	No sugar
1 " 1,000	Beta-naphthol	1 " 1,000	238 cc.
1 " 1,000	Alcohol	1 " 25	250 "

Saccharin was included in the above experiments on account of statements made recently in medical journals that it has decidedly antiseptic powers, and that it may be used liberally for internal administration. Such an opinion would be likely soon to lead to its use as far as its taste would permit.

The inferences from the above observations are that salicylic acid is especially objectionable in a malt extract, and that saccharin is also unsuitable. Alcohol in the extract is also objectionable. Beta-naphthol has some retarding action, but not very considerable. Boric acid and sodium acid sulphite seem to have but little retarding effect. Their effect, however, by long-continued action on the malt extract before adding it to the starch has not been tested. It is obvious that these conclusions apply to the use of preservatives in prepared articles of food.

With a view of adding further to this point, a sample of Fairchild's pancreatic extract was examined as to its action on starch, with and

without addition of salicylic acid. 0·3 grm. pancreatic extract in 100 cc. starch solution formed sugar equal to 161·3 Fehling's solution; in presence of one-thousandth part of salicylic acid, no sugar was formed.

The President said that the paper just read was a very important one in many respects, and he was glad to think that members of the Society so far distant as Philadelphia had made such a valuable contribution to the proceedings.

THE DETECTION OF SACCHARIN IN BEER.

By A. H. Allen, F.C.S., F.I.C.

Clause 5 of the Customs and Inland Revenue Act has special reference to the use of saccharin as a sweetener and preservative of beer, and, in the discussion of the Bill in Committee, on April 27th, Sir Lyon Playfair, who was supported by Sir Henry Roscoe, contended that it was a mistake to prohibit the use of saccharin instead of sugar, as such a course would have serious deterrent results on a growing industry. He stated that foreign brewers were using saccharin largely, and that it could be manufactured in this country at a cost of 20s. to 30s. per pound. He concluded by asserting that the presence of saccharin in beer was very difficult to detect, and that there was another substance which, if employed in conjunction with saccharin, would absolutely prevent its detection, and therefore the result would be that if its use were not regulated the Excise would be defrauded. In consequence of the last statement I wrote to Sir Lyon Playfair asking what was the substance which would prevent the detection of saccharin if used in conjunction with it, and learned that the remark had applied to salicylic acid. Under these circumstances it is worth while to review shortly the analytical characters of saccharin.

Falberg's saccharin, we all know, is a coal-tar product, of which the systematic name is benzoyl-sulphonic-imide. It is the anhydride of ortho-sulphamidobenzoic acid, and forms a series of salts as sweet as, if not sweeter than, itself. The sweet taste of saccharin is variously stated at from 130 to 330 times that of cane sugar. As a matter of fact some saccharin tabloids, each of which was said to be equivalent in sweetening power to a lump of sugar, were found to have an average weight of 0·45 grain each, while an average lump of sugar weighed

about 90 grains. This relationship indicates that the saccharin has about 200 times the sweetening power of sugar.

When heated, saccharin partially sublimes, giving vapors of an intensely sweet taste. If heated in admixture with caustic soda to 250° C. it forms salicylic acid, which can be detected by dissolving the residue in acidulated water, agitating with ether, evaporating the ethereal solution of dryness, and adding ferric chloride, when the characteristic violet coloration is produced. When saccharin is ignited in admixture with caustic or carbonated alkali, preferably with addition of a little oxidizing agent, such as nitre, it yields a residue containing sulphate, which of course can be detected by adding chloride of barium to the acidulated solution. The weight of sulphate of barium precipitated, if multiplied by 0·785, gives the weight of saccharin to which it corresponds.

An aqueous solution of saccharin when heated with potassium ferricyanide becomes colored apple-green, an odor of hydrocyanic acid being evolved.

Saccharin is extracted with tolerable facility on agitating its acidulated aqueous solution with ether.

Utilizing these reactions I have found no difficulty in detecting less than ½ grain of saccharin in one pint of beer. The beer was concencentrated to about one-third, and at once agitated with ether. As a matter of fact, I added a little phosphoric acid, but this precaution was superfluous, as the liquid had already a marked acid reaction. Acidulation with sulphuric acid is not desirable. The ethereal solution left on evaporation is a residue which was, of course, intensely bitter and was not adapted for the recognition of saccharin by any test other than the production of sulphate on ignition in the presence of alkali. By this method, however, distinct evidence of the presence of saccharin was obtained, whereas a blank experiment on the same beer, to which no saccharin had been added, failed to show any trace of sulphates by the same process.

A purer residue is obtained by treating the beer with acetate of lead and filtering before agitating with ether. There is no occasion to remove the excess of lead, and in fact the use of sulphuretted hydrogen would be very undesirable.

It will be seen that the detection, and even the determination of saccharin in beer presents no great insurmountable difficulty, even in the presence of salicylic acid. I do not know of any organic sub-

stance containing sulphur, which would be likely to be used in or be present in beer, which would be extracted by ether from its acidulated solutions, and hence be likely to interfere with the above method of detecting saccharin. The Inland Revenue chemists have expressed the opinion that they would be able to recognize saccharin in beer by its taste. This might be so in the absence of hop-substitutes, but the presence of quassia would produce an ethereal extract of so intensely bitter a taste as wholly to mask the sweetness due to saccharin. At any rate, if the Inland Revenue chemists have devised any process by which the saccharin can be isolated from beer in all cases in such a state of purity as to be recognizable by the taste it is to be hoped that they will depart from their usual practice and communicate their knowledge to their brother chemists.—*The Analyst,* June 1888, p. 103.

NOTE ON ANTIPYRETICS.[1]

By Edward R. Squibb, M. D.

The word "antipyretic," although not new, has but recently come into common use as a substitute for the word "febrifuge." The words are synonymous and of the same ultimate derivation. Antipyretic is that which is opposed to fire, and fever comes from fire. Febrifuge is that which causes fever to fly, or to be fugitive. Hence the significance of both words is to oppose, counteract or dispel fever. The choice between the words seems to be a matter of taste or fashion, and febrifuge seems to be going out of use.

The oldest and best febrifuge is quinine, and this still stands at the head of the class of newer antipyretics. The origin and application of quinine are too well known to require notice here, and its value is too well established to be in much danger from the more modern agents. Until quite recently the great drawback to the use of quinine was its high cost, and almost all the recent antipyretics were discovered through the efforts of chemists either to make quinine artificially, or to make substitutes for it. The making of quinine synthetically or artificially, although several times announced, has not yet been accomplished; and its great abundance and low cost for the present, and probably also for the future, have taken away the incentive to make it synthetically, because if so made it could not be so

[1] Read before The Kings County Medical Association, Nov. 1, 1887; republished from Ephemeris III, p. 1063.

very much cheaper than from natural sources; and therefore it does not offer the inducement of the very large profits offered when the natural product was so costly. But the modern research in this direction has yielded very interesting and important results, in addition to the still increasing list of substitutes or antipyretics.

A brief notice of only the more prominent substances of this list is all that can be undertaken here, and all the material for this is compiled from a few of the numerous authorities on this subject. Nothing original is offered, and nothing as being very accurate, because every article of the list is put forth with the conflicting statements so apt to result from the combined influences of pecuniary interests, enthusiasm, and limited observation stimulated by the universal appetite for novelties.

Chinoline.—In 1842, Gerhardt, by distilling quinine with caustic potassa and water, discovered a base which he called quinoline, but the dearness of quinine forbade attempts to utilize the base from that source. By treating cinchonine in the same way he obtained another base which he named chinoline, and the comparative cheapness of cinchonine encouraged the investigation of chinoline and its salts. These were found to be active antipyretics, and the base was used through many years as a nucleus from which various chemical substances were built up of varying character and power as antipyretics or quinine substitutes.

In 1880, Dr. W. Königs, of Munich, gave a new impetus to the researches based upon chinoline, by making this in quantity synthetically or artificially from aniline. He was soon joined by Baeyer, Skraup, and others in a new order of investigations, which have been very fruitful, and are still in active progress.

The tartrate of chinoline was one of the earliest antipyretics, and was largely used. It is still in the markets, and still occasionally used, but has given place to more recent agents.

Resoin or Resorcin.—About 1862, Hlasiwetz and Barth, following up Gerhardt's idea of 1842, distilled certain resins with alkalies and water, and obtained a substance which they called resorcin, because it was obtained from resin and was similar to orcin from archil or orchil. Subsequently Körner prepared resorcin synthetically by building it up from a benzol nucleus, and from its constitution it is meta-dihydroxylbenzol and belongs to the phenols.

Like salicylic acid it was first used and extolled as an antiseptic, and it was brought into prominence chiefly by Dr. Justus Andeer, of Wurzburg. Later, in 1880, Dr. Lichtheim, of Berne, showed that it was also an active antipyretic, with many effects analogous to salicylic acid, and for some time it was used quite largely.

Salicylic Acid.—Salicylic acid had been long known and many of its characteristics well studied, when in 1874 investigation into its therapeutic effects and use gradually led up to its antipyretic action now so well known, but with insufficient investigation it has had to give way to agents with newer claims.

Kairin, or Kairine, and Kairoline.—In 1882, the investigations of Drs. O. Fischer and W. Königs, of Munich, on the alkaloids, assumed that the characteristic properties of quinine were not based upon the chinoline nucleus, but by the introduction into this nucleus of an oxygen bearing or a hydrogen bearing element. A number of substances were prepared in following up this new departure, and these were submitted for physiological investigation to Dr. W. Filehne, of Erlangen. The net result of these joint labors was the production by Dr. Fischer of oxychinolinmethylhydride which was called kairine, and by Dr. Königs, of chinolinmethylhydride, which was named kairoline. The first of these soon after became the kairin of commerce, and having been patented, was extolled and advertised into a large usage. This seems to have been the first of the antipyretics that was started as such, and it was more largely used for a time than any of its predecessors; and it did more to introduce the fashion upon which its successors were to be still more largely used. It was the first one to be stimulated by the mercantile influence of a patent, and the patentees took good care that all that could be said in its favor should be widely advertised. Therefore it was very largely sold and used, and laid a good foundation for its successors, as its disadvantages were slowly recognized. The patentees are also the patentees of its immediate successor, antipyrin, and they are the well known enterprising color makers, Meister, Lucius and Brüning, of Hoechst, Germany. Each package of kairin is labelled as being protected by letters patent in Germany and the United States, and importation into France prohibited.

Antipyrin.—In the early part of 1884, Dr. L. Knorr, of Erlangen, synthetically prepared an oxygenated alkaloid which he called anti-

pyrin. This was investigated therapeutically by Prof. Filehne, who reported that it was an active antipyretic. For some months nothing was published in regard to the character or composition of this substance, but when it had been patented and introduced into commerce by the color makers above mentioned, Dr. Knorr published a paper stating that antipyrin was a derivative of an hypothetical base which he called chinizin, the systematic name being dimethyloxychinizin. Its antipyretic action was soon reported upon very favorably by many German observers of note, and it was made on a large scale and well advertised at a high price, but not so high as kairin. As it came into use the makers sought to patent it in other countries, and found no difficulty in extending the German patent to the United States. But in France there was difficulty. In the political economy of France, and to the great honor of the nation, it has long been held that the interests of suffering humanity are superior to the interests of inventors, and therefore, as a sanitary measure, patents upon medicines are not granted, and patented medicines from all sources are prohibited. The German patentees were part owners in a color-making company in France, and through this connection obtained a patent on the process for manufacturing dimethyloxychinizin as an aniline product. But as it was not used for any industrial purposes, and could not be sold as a patent medicine, the French patent could not be used; and as processes and articles patented in France but made elsewhere are absolutely prohibited, France seemed to be excluded from the use of antipyrin as well as kairin, unless it be admitted that any chemical manufacturer or pharmacist in France has the legal right to make and sell such articles when used only as medicines, without regard to the patent rights of other nations. This point is understood to be still unsettled, and every parcel of kairin and antipyrin bears on the label, "Importation into France prohibited on account of the French Patent Laws."

Thallin.—During 1884 a chinoline derivative was made by Dr. Skraup in this same search after quinine substitutes—which from yielding a very green color on reacting with ferric chloride and oxidizing agents was called thallin. The systematic chemical name of this base is tetrahydroparachinanisol, and the sulphate of this base is the salt commonly used as an antipyretic. Several of the salts of the base were investigated at the clinic of Prof. Nothnagel, and it is said to be very active in comparatively small doses. It is patented and

largely advertised, but in competition with other agents which have had these advantages, it has not come very largely into use. It appears to be a very active agent for reducing abnormal temperatures.

Antifebrin.—In 1853 Gerhardt discovered by a reaction between aniline and acetic acid a neutral body which was found to be phenyl-acetamide, or acetanilide. This substance was recently found to be an active antipyretic, and under the name antifebrin was, in 1886, very favorably reported by Prof. Kussmaul of Strassburg, as yielding very satisfactory results in comparison with antipyrin, whilst the cost is very much less, and the effective dose very much smaller. It is not patented, although the name, and perhaps a special quality under the name, is claimed as being proprietary. But it is also commonly sold now as acetanilide, of quite as good quality, and for but little over one-half the price it brings as antifebrin. That is, the two are identical except in price, and both are cheap.

Salol.—This combination of about 60 per cent. of salicylic acid and 40 per cent. of phenol or carbolic acid, was first produced by Prof. von Nencki, of Berne, and investigated by Dr. Sahli, also of Berne—the report of the latter upon the compound having been made in April, 1886. It was soon patented in Germany and the United States, and is now controlled by these patents. It is said to combine the properties and effects of its two constituents, and if so it is difficult to see why they should not be extemporaneously prescribed with the advantage of varying the proportion of the elements to meet the special requirements of varying cases.

Antithermin.—This is one of the two most recent additions to the long list of antipyretics. The systematic name given for it is phenyl-hydrazinlevulinic acid, and with such a constitution it is evidently nearly related to antipyrin.

Acetyl-amidophenol is the other of the two very recent antipyretics, and as yet this one does not appear to have received a common short name; and up to this time little appears to have been said in regard to these new agents.

No notice of prominent antipyretics should omit the mention of two of the oldest and best, although these may now be temporarily put aside for newer claimants to professional popularity. These two are veratrum viride and aconite.

In conclusion, it may be of interest to add a list of prices at which

these newer antipyretics are now sold by the wholesale druggists and to present specimens of each of them for inspection.

Sulphate of Quinine of the best makers at about.....	40c.	per ounce.
Tartrate of Chinoline.....	70c.	"
Resorcin.....	30c.	"
Salicylic acid, patented.....	20c.	"
Kairin, patented.....	$2.00	"
Antipyrin, patented.....	1.25	"
Sulphate of Thallin, patented.....	1.75	"
Antifebrin, 30c. per ounce, or as Acetanilide.....	15c.	"
Salol, patented.....	40c.	"

THE CARDAMOM PLANT.[1]

The cardamom of commerce, *Elettaria Cardamomum*, a member of the natural order of Zingiberaceæ, is indigenous to the forests of Malabar, where it is found growing wild at altitudes ranging from 1800 to 3500 feet above sea level. A moderate degree of shade and any amount of moisture are the climatal conditions most favorable for the plant's luxuriant growth.

If the shade be too profound, the stalks which spring from the rhizome will be but few in number, but if sunlight be moderately admitted they will increase amazingly, often exceeding seventy in number, but if exposed to sunshine for more than an hour or two daily, the plant languishes and eventually dies out. Each stalk throws out a scape, or peduncle, varying in length from 1½ to 2½ feet, on which the fruit is produced in the form of capsules, arranged in an alternate manner on each side of the shaft, at a distance of about 2½ inches from each other. From the description of the plant above given a large crop might be expected, but the result does not fulfill the expectation to the anticipated extent, as, owing to the large amount of moisture contained in the vegetable tissues of the cases which cover the grains, one pound of the green fruit reduces down to one quarter or sometimes one-fifth of a pound when fully dried.

[1] From the *South India Observer*. Reprinted from the *Phar. Jour. and Trans.*, June 9, 1888, p. 1032.

In its natural climate and soil, a sandy loam devoid of clay, the plant begins to bear in the second and yields a full crop in the fourth year. My experience does not enable me to state precisely the yield of each tree. I think that the planter may consider himself fortunate if he succeeds in harvesting on the average one-quarter pound of dry cardamoms per tree in the total number of sixty trees which occupy an acre, in the fourth year, less a certain percentage of loss occasioned by rats, squirrels and snakes, all of which species of vermin evince a partiality for the fruit and are ever on the watch to pounce upon it the moment it becomes ripe; and this entails the necessity of great watchfulness on the part of the planter to forestall these marauders, and be in the happy position of that early bird which proverbially "gets the worm." Each stalk, as it completes its functions in bringing its scape to maturity and becomes effete, is succeeded by another stalk, sprouting from the parent rhizome, which begins to bear in the course of a year; and in this order the growth proceeds with successive renovations, until the plant attains its ultimate span of existence, in the lapse of time; the extent or duration of which is not known to the writer.

Until Ceylon glutted the home markets, cardamom sold well, but they hardly fetch remunerative prices now, as the quotations have fallen from 5*s.* a lb. to 1*s.* 4*d.*, and even less for the small kinds, of which there is a considerable proportion in all lots, and which sell for about 8*d.* per pound. The spontaneous way in which the plant was for a long time supposed to be exclusively produced, *viz.*, from the concussion of the ground occasioned by the fall of a large tree felled over it, was, if not a purely fanciful idea, probably a cunning one suggested by the interested motives of those who were the fortunate holders of the cardamom hills and habitats. Whether such an origin has any better foundation to rest upon than the mere imagination, it would be idle here to discuss as there is no question of the fact that cardamoms can be reared from seed sown in shaded nurseries in the ordinary way, or from the division of the rhizome into parts containing young shoots or eyes fit for development into them. The former is undoubtedly the quickest way of forming a plantation; although it must be admitted the seed is singularly slow in germinating, taking never less than three and often as many as five months before the little spikes show themselves above ground. Within a year from this time the plant will, with careful culture, have attained a sufficient

size to be planted out into pits dug for their reception in the shade of the forest, suitably prepared by trenching and the thorough extirpation of root and branch of the brush-wood occupying the surface. The process cardamoms are put through, called "bleaching," is a tedious one and, if left to agents, particularly costly. It is done by exposing them to the fumes of sulphur in closed receptacles, a process which has the effect of transforming their dingy grey into a delicate, pale straw color. This may be called one of the tricks of the trade, which, while perhaps it may not appreciably deteriorate or detract from the quality or flavor of the grains, captivates the public eye and secures a better price.

JAMBUL.

By William Elborne, F. L. S.

Assistant Lecturer in Materia Medica and Pharmacy in the Owens College.

The term "jambul," as now usually accepted, is understood to apply to the seeds of *Eugenia Jambolana*, Lam. (*Syzygium Jambolanum*, DC.), a tree attaining a height of from 70 to 80 feet, belonging to the natural order Myrtaceæ, and, like others of the genus *Eugenia*, is for the most part a native of tropical America, the West Indies and of the East. In India the bark, leaves and fruit of this tree are used in medicine; the seeds in the form of powder are at present being recommended in this country as a remedy in diabetes.

The bark when fresh is of a gray or pale brown color, with a somewhat fissured and scabrous surface. Its section is pale white, soft, brittle and full of starch-like granules. Its juice is rather sticky, with an acidulous and astringent taste and acidulous smell. According to Dymock, a description apparently applying to the bark in the dried state, "the bark is gray and fissured externally; internally it is red and fibrous; its minute structure is remarkable in having several rows of very large pitted oblong oval cells, which can easily be seen with the naked eye. The odor is like that of oak bark, and the taste very astringent." It is used in the preparation of astringent decoctions, gargles and washes.

The leaves differ from those of other myrtles in not being pellucid punctate; they are shortly petiolate, 3 or 4 inches long, smooth, leath-

ery, varying between oval and obovate oblong and between acuminate and very obtuse, the West Indian form being rounded at the apex. They have an aromatic odor and taste.

The fruit unless improved by cultivation is about the size and shape of an olive of a purple color and very astringent; within it is a thin white papery shell which encloses a large green kernel, also very astringent. The epidermis is smooth, shining and very thin, and can readily be removed by scratching; within it is the pulp of a dark reddish color. The seed when fresh is of a pinkish color, which becomes brown on drying. The rind of the fruit is said to contain the active principle (Year-Book of Pharmacy, 1886, p. 208). The powdered seeds are highly useful in diabetes (Khory's "Ind. Mat. Med.")

The jambul operated upon in the following notes was presented to the Materia Medica Museum of the Owens College last year by Mr. Thomas Christy, of London. It consisted of the dried kernels of the seeds, which had been cut in half transversely, apparently to facilitate the process of drying. The ovoid pieces were about the size of large peas, of a dull earthy-brown color with a dry earthy fracture, resembling in appearance fragments of pale catechu (*Uncaria Gambier*); odor slightly aromatic.

Moisture.—Ten grams reduced to a fine powder and exposed in a porcelain dish to the temperature of a water-bath until it ceased to lose weight lost 1·02 gr.=10·2 per cent.

Ash.—The dried residue from above, thoroughly incinerated in a platinum dish, left an ash weighing ·25 gr.=2·5 per cent. upon the original substance.

I. Petroleum Ether Extract.—Twenty grams of the original substance reduced to fine powder was made up to 100 cc. with petroleum ether and macerated for forty-eight hours with frequent agitation. The clear liquid was poured off and the residue thrown upon a filter, and filtration continued by the addition of fresh ether until the filtrate measured 100 cc. The latter was of a yellowish-green color, and 20 cc. evaporated upon a water-bath until free from the solvent gave a residue of ·015 gr.=·37 per cent., consisting of chlorophyll and fat free from odor.

Experiments with other portions of the extract gave evidence of the presence of a mere trace of an exceedingly volatile oil, the odoriferous principle.

II. Ether Extract.—The seed residue from I., after being well washed with petroleum ether and dried by exposure to the air, was macerated with about 70 cc. of ether for forty-eight hours with frequent agitation. The clear liquid being poured off and the residue thrown upon a filter, filtration was continued with fresh ether until the filtrate measured 100 cc. of the latter, which was of a bright yellow color; 20 cc. upon evaporation left a dark colored resinous residue weighing ·014 gr.=·4 per cent.

The ether residue is perfectly soluble in alcohol, and partially in water. Extracted with water, the aqueous filtrate develops a dark color with potash, is precipitated by acetate of lead, yields an inky mixture with ferric and ferrous salts, is not precipitated by solution of gelatin, and after having been boiled with a little dilute sulphuric acid copiously reduces alkaline copper solution, reactions indicating the presence of gallic acid.

Further experiments showed that water dissolved from the water-bath dried extract an amount equivalent to 0·1 per cent.

III. Alcohol Extract.—The seed residue from II., washed with ether and dried, was exhausted with absolute alcohol according to the above method, the finished product measuring 100 cc. Of the latter, 20 cc. evaporated to dryness yielded a brown residue of 0·035 gr.=0.8 per cent., which was perfectly soluble in water; the aqueous solution gave negative results with alkaloidal reagents, and towards others, results were obtained with lead acetate, ferric chloride, gelatin, and alkaline copper solution as in II., indicating the presence of the same body.

IV.—The seed residue from III., exhausted with water according to above method, and 20 cc. of the finished product evoporated to dryness on a water-bath weighed 0·19 gr.=4·7 per cent. The liquid extract was of a dark sherry color; 20 cc. mixed with twice the volume of absolute alcohol, set aside for twenty-four hours, filtered and the residue left in the filter washed with a mixture of alcohol and water (two vols. to one) weighed 0·05 gr.=1·25 per cent. of albuminous matters. The filtrate was evaporated until free from alcohol, and shaken twice with an equal volume of acetic ether. The ethereal layers being removed and the ether distilled off, left a colored residue weighing 0·03 gr.=0·75 per cent., consisting essentially of gallic acid.

According to the above, we arrive at the following proximate composition of jambul:—

Essential oil	a trace.
Chlorophyll and fat	0·37
Resin soluble in alcohol and ether	0·30
Gallic acid	1·65
Albumin	1·25
Colored extractive soluble in water	2·70
Moisture	10·00
Insoluble residue	83·73
	100·00

I have to thank Mr. Harwood for services rendered in connection with this investigation.—*Phar. Journ. and Trans.*, May 5, 1888, p. 921.

PHARMACOPŒIA OF THE PHILADELPHIA HOSPITAL.

(*Continued from page* 317.)

Mistura Gentianæ Acida.

Each tablespoonful contains:

Dilute Nitrohydrochloric Acid	m. x.
Comp. Inf. of Gentian, q. s. ad	ƒʒ iv.

Dose: Tablespoonful.

University Hospital.

Mistura Magnesii et Hydrargyri.

Each tablespoonful contains:

Magnesia (heavy)	ʒi.
Blue Mass	gr. v.
Powd. Acacia	q. s.
Sp. of Ammon. Arom	m. vijss.
Syrup of Orange	ƒʒij.
Peppermint Water q. s. ad	ƒʒiv.

Dose: One or two tablespoonfuls, as needed.

Mistura Magnesii et Rhei.

Each tablespoonful contains:

Comp. Rhubarb Powder	ʒij.
Acacia	q. s.
Lime Water	
Peppermint Water āā q. s. ad	ƒʒiv.

Dose: One tablespoonful.

Mistura Magnesii Comp.

Each wineglassful contains:

Magnesium Sulphate	ʒiv.
Fl. Ext. of Senna	ƒʒjss.
Syrup	ƒʒiv.
Anise Water	ƒʒiv.
Water q. s. ad	ƒʒii

Dose: Wineglassful.

Mistura Pectoralis.

Two teaspoonfuls contain:

Ammonium Chloride	gr. vijss.
Syrup of Senega	m. xv.
Comp. Licorice Mixture q. s. ad	ƒʒij.

Dose: Two teaspoonfuls.

Mistura Picis et Pruni Virg.

Each tablespoonful contains:

Pine Tar	q. s.
Lime Water	ƒʒiv.

Macerate the tar for three days in the lime water, filter and percolate through 30 grains of ground wild cherry bark, adding sufficient lime water to make the percolate measure ƒʒiv.

Dose: Two to four teaspoonfuls.

Wood.

Mistura Rochelle.

Each wine glassful contains:

Rochelle Salt	ʒiv.
Syrup	ƒʒiv.
Peppermint Water	ƒʒiv.
Water q. s. ad	ƒʒii.

Dose: Wineglassful.

Mistura Sodii Bicarb.

Each tablespoonful contains:
Sodium Bicarbonate..... gr. x.
Spir. of Ammon. Arom..... m. viiss.
Peppermint Water...q. s. ad ƒʒiv.
Dose: Tablespoonful.

Mistura Sodii Comp.

Each tablespoonful contains:
Sodium Bicarbonate..... gr. x.
Beachwood Creasote..... gtt. j.
Powd. Acacia..... q. s.
Syrup of Ginger..... m. xxx.
Tr. of Lavender Comp..... ƒʒj.
Lime Water..... q. s. ad ƒʒiv.
Dose: Tablespoonful.

Mistura Zollikofferi.

(Zollikoffer's Mixture.)

Each tablespoonful contains:
Potassium Iodide.....
Guaiac..... āā, gr. v.
Wine of Colchicum Root... m. xv.
Cinnamon Water.....
Syr. of Ginger..... āā q. s. ad ƒʒiv.
Dose: Tablespoonful.

OLEA.

Oleum Carbolatum.

(1-40, 1-30, 1-20, 1-15).

Oleum Lini et Calcis.—Carron Oil.

Linseed Oil.....
Lime Water, equal parts.

PILULÆ.

Pilulæ Antineuralgicæ.

Each pill contains:
Arsenic..... gr. $\frac{1}{32}$.
Strych. Sulph..... gr. $\frac{1}{64}$.
Ext. of Belladonna..... gr. $\frac{1}{8}$.
Cinchonine Sulphate..... gr. ij.
Vallet's Mass..... gr. ij.
Dose: One pill.

Pilulæ Antipyreticæ.

Each pill contains:
Powd. Opium..... gr. $\frac{1}{4}$.
Powd. Digitalis..... gr. ss.
Quinine Sulphate..... gr. ij.
Dose: One pill every six hours.
Niemeyer.

Pilulæ Argenti et Opii.

Each pill contains:
Silver Nitrate..... gr. $\frac{1}{6}$.
Opium Powd..... gr. j.
Dose: One to two pills.

Pilulæ Arsenicales.

Each pill contains:
Arsenious Acid.....gr. $\frac{1}{60}$, $\frac{1}{30}$ or $\frac{1}{30}$.
Dose: One pill.

Pilulæ Atropinæ.

Each pill contains:
Atropine Sulphate..... gr. $\frac{1}{100}$ or $\frac{1}{60}$.
Dose: One pill.

Pilulæ Aperientes.

Each pill contains:
Ext. of Belladonna..... gr. $\frac{1}{8}$.
Ext. of Nux Vomica..... gr. $\frac{1}{4}$.
Ext. of Hyoscyamus..... gr. ss.
Sodium Bicarbonate..... gr. $\frac{1}{4}$.
Ext. of Colocyn. Comp..... gr. i.
Ext. of Rhubarb..... gr. i.
Oil of Anise..... gtt. $\frac{1}{4}$.
Dose: One to two pills.

Pilulæ Camphoræ et Opii.

Each pill contains:
Camphor..... gr. ij.
Powd. Opium..... gr. j.
Dose: One to two pills.

Pilulæ Cinchoninæ.

Each pill contains:
Cinchonine Sulphate, gr. j, ij, iij or v.
Dose: One or more pills.

Pilulæ Cinchoninæ Comp.

Each pill contains:
Ext. of Nux Vomica..... gr. ¼
Cinchonine Sulphate.....
Reduced Iron..... āā gr. ij.
Dose: One pill.

Pilulæ Cinchoninæ et Arsenici.

Each pill contains:
Extract of Nux Vomica..... gr. $\frac{1}{4}$.
Arsenious Acid..... gr. $\frac{1}{24}$.
Cinchonine Sulphate.....
Reduced Iron..... āā gr. ij.
Dose: One pill.

Pilulæ Colocynthidis Comp.

Each pill contains:
Extract of Belladonna..... gr. ⅛.
Resin of Podophyllum..... gr. ⅛.
Ext. of Gentian..... gr. j.
Ext. of Colocynth Co ..... gr. ij.
Oil of Caraway..... gtt. ss.
Dose: One pill at night, or one night and morning.
Episcopal Hospital.

Pilulæ Ferri Carb.

Each pill contains:
Ferrous Sulphate.....
Potassium Carbonate..... āā gr. ijss.
Dose: One to two pills.
Blaud.

Pilulæ Ferri et Quassiæ Comp.

Each pill contains:
Ext. of Nux Vomica..... gr. ¼.
Ext. of Quassia..... gr. j.
Reduced Iron..... gr. j.
Powd. Soap..... gr. ss.
Dose: One to two pills.

Pilulæ Hepaticæ.

Each pill contains:
Ext. of Hyoscyamus..... gr. ss.
Ext. of Colocynth. Co..... gr. jss.
Blue Mass..... gr. ijss.
Dose: One to two pills.

Pilulæ Hydrarg. Chlor Cor.

Each pill contains:
Mercuric Chloride...gr. $\frac{1}{20}$, $\frac{1}{10}$, or $\frac{1}{12}$.
Dose: One pill.

Pilulæ Hydrarg. Iodid. Rub.

Each pill contains:
Mercuric Iodide..... gr. ⅛ or ¼.
Dose: One pill.

Pilulæ Hydrarg. Iodid. Vir.

Each pill contains:
Mercurous Iodide.....gr. ⅛, ¼, or ½.
Dose: One pill.

Pilulæ Manganesii Oxidi.

Each pill contains:
Manganese Oxide Prec..... gr. v.
Dose: One pill.

Pilulæ Plumbi et Opii.

Each pill contains:
Powd. Opium..... gr. ss.
Acetate of Lead..... gr. j.
Dose: One to three pills.

Pilulæ Podophyllini Comp.

Each pill contains:
Resin of Podophyllum..... gr. ¼.
Ext. of Colocynth. Co.....
Ext. of Hyoscyamus..... āā gr. j.
Sodium Bicarb..... gr. ¼.
Oil of Anise..... gtt. ¼.
Dose: One pill.

Pilulæ Quinidinæ.

Each pill contains:
Quinidine Sulphate gr. j, ij, iij, or v.
Dose: One pill.

Pilulæ Rhei et Gentianæ.

Each pill contains:
Ext. of Hyoscyamus.....
Ext. of Gentian.....
Ext. of Rhubarb..... āā. gr. j.
Sodium Bicarb..... gr. ¼.
Dose: One pill.

Pilulæ Triplices.

Each pill contains:
Podophyllum Resin..... gr. ¼.
Blue Mass..... gr. j.
Aloes Purif..... gr. ij.
Dose: One pill.

Pilulæ Zinci Oxidi Comp.

Each pill contains:
Ext. of Belladonna..... gr. ½.
Zinc Oxide..... gr. iij.
Dose: One pill at night.

PULVERES.

Pulveres Bismuthi.

Each powder contains:
Bismuth Subnitrate gr. 5, 10, 15 or 30.
Dose: One powder.

Pulveres Bismuthi Comp.

Each powder contains:
Bismuth Subnitrate..... gr. x.
Aromatic Powder..... gr. v.
Dose: One to three powders.

(*To be continued in the next number.*)

AMERICAN PHARMACEUTICAL ASSOCIATION.

The thirty-sixth annual meeting of the American Pharmaceutical Association, will be held in Detroit, Michigan, first session, Monday, September 3rd, at 3 P. M. Aside from the usual attractions presented by our meetings, preparations have been made for our reception by the pharmacists of Detroit, matters both scientific and recreative being elaborated to an unusual degree.

The Michigan Pharmaceutical Association holds its annual meeting simultaneously with our own, and it may safely be predicted that the members attending both Associations will outnumber any collection of pharmacists in the previous history of our country.

Full information regarding hotel and railway rates will be furnished our members, in the usual annual circular of the permanent secretary.

The Exhibition promises to equal if not surpass that of any preceding period in our history. Commercial interests are now recognized as a part of the object of our meetings, and it is to be presumed that extraordinary endeavors will be made to render conspicuous displays of commercial products. The local Secretary, Mr. James Vernor, 235 Woodward Avenue, Detroit, will give information regarding matters connected therewith.

Dr. A. B. Lyons, P. O. Box 583, Detroit, Secretary of Committee on Scientific Papers, should receive the papers at as early a date as possible.

J. U. LLOYD,
President.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Massachusetts College of Pharmacy held its twentieth commencement at Association Hall, Boston, May 24th, when addresses were made by President H. Canning, Professor E. L. Patch and John H. Chute, Ph. G. The degree of Ph. G. was conferred upon the following:

Daniel Williams Adams, George Guy Bailey, Emory Franklin Bennett, Robert Henry Billings, Albert Edward Booth, Frank Tuttle Brackett, Wilfred Fletcher Brown, Nathan George Bubier, John Henry Chute, Walter Addison Claflin, William Corner, Charles Edgar Dotey, Llewellyn Frank Doyle, Everett Alexander Graves, George Walker Hastings, Ralph Creighton Hovey, Louis Jonas Hutchinson, Ernest Marshall Johnson, Marshall Ryder Johnson, Paul Constantine Klein, Franklin Haynes Martin, Alfonso Frederic Marsh, Frank Bowdoin Mathews, Charles Milan Morse, Frank Boyden Morse, George Frederick Moulton, Clifford Ramsdell, Winslow Hudson Rogers, George Herbert Rose, John Albert Schumacher, Nat Vaughan Shannon, Charles Augustus Siegemund, James Augustus Slattery, Charles Franklin Stacey, Joseph Allen Tailby, Walter Priestley Thorn, Jorge Vargas-Heredia, William Henry Weed, Charles Thompson Willard.

The St. Louis College of Pharmacy has elected the following faculty: Professor of Chemistry, C. O. Curtman, M. D., Ph. G.; Professor of Materia Medica and Botany, O. A. Wall, M. D., Ph. G.; Professor of Pharmacy, J.

M. Good, Ph. G.; Professor of Practical Pharmacy, Francis Hemm, Ph. G.; Professor of Microscopy, H. M. Whelpley, Ph. G. This is the first election made under the new charter, which abolishes the system of annually electing a faculty. The present professors will hold their positions until their resignation is accepted or they are removed for just cause.

The Alabama Pharmaceutical Association met at Selma, May 9th, the President, J. B. Collier, in the chair. The President's address and the reports of officers, committees and of the Pharmacy board were read and duly considered, and resolutions were passed favoring the reduction of the internal revenue tax on alcohol, and the repeal of the clause in the internal revenue law classifying druggists as liquor dealers. Papers were read by Albert E. Brown on emulsions of cod liver oil and of other oils; by T. T. Boyd on the action of medicines; and by E. P. Galt on antipyrin and spirit of nitre. President J. B. Collier, Secretary P. C. Candidus and Treasurer E. P. Galt were re-elected to these offices. The eighth annual meeting will be held at Birmingham on the second Tuesday in May (14th), 1889.

The Delaware Pharmaceutical Society held its annual meeting in Wilmington, May 3rd. The usual routine business was transacted; some changes were made in the constitution and by-laws; certain provisions of the pharmacy law were discussed, and a committee on the preliminary revision of the Pharmacopœia was appointed. The officers of the preceding year were continued, viz.: H. R. Bringhurst, president; J. M. Harvey, secretary, and J. J. Gallagher, treasurer. The next meeting will again be held in Wilmington on Thursday, May 2d, 1889.

The Indiana Pharmaceutical Association held its seventh annual meeting at Fort Wayne, June 6th. The usual routine business was transacted and a number of papers were read, among them one on "College Diplomas Recognized by Boards of Pharmacy," by A. J. Detzer; "Effect of Light on Fluid Extracts," by J. K. Lilly; "Random Notes," "Syrup of Ipecac," and "Wax in Ointments," by L. Eliel; "White or Yellow Wax in Cerates," and "Morphine Oleate," by W. H. Ross. Mr. A. L. Green, of Lafayette, was elected president; J. R. Perry, of Indianapolis, secretary, and H. Pomeroy, of Indianapolis, treasurer. The eighth annual meeting will be held at Indianapolis in 1889, at the same time as the meeting of the State Medical Society.

The Iowa Pharmaceutical Association met at its ninth annual meeting in Des Moines, May 2, Pres dent W. C. Bryant in the chair. The president's address and the reports of officers and committees were received and disposed of. Resolutions were passed in favor of reducing the tax on alcohol, and of abolishing the liquor dealer's tax on druggists. The new liquor law of Iowa materially modifies or repeals some of the provisions of the pharmacy law, and it was the opinion of those present that after the expiration of the permits now held by them, pharmacists cannot sell liquor with any degree of self or professional respect. Papers were read by H. Tiarks, on "Detannating Fluid Extracts;" by F. Lax, on "The Preparation of Galeni-

cals from Fluid Extracts;" by William Mœrschel, on "Nitrous Ether;" by F. O. Goldthwaite, on "Concentrated Spirit of Nitrous Ether;" by C. Schadt, on "Commercial Tincture of Chloride of Iron"; and by the same member on "Mucilage of Acacia." R. W. Crawford, of Fort Dodge, was elected president; Rosa Upson, secretary, and J. B. Webb, of DeWitt, treasurer. The next meeting will be held in Dubuque, on the first Wednesday (5th) of June, 1889; T. W. Ruete, local secretary.

The Kansas Pharmaceutical Association convened at Abilene, May 16, President R. S. Drake in the chair. Reports were received from the officers and a number of committees, and various addresses were delivered, including the annual address by the president, and one on "The Advancement of Pharmacy," by Prof. L. E. Sayre. Papers were read by Miss Rice, on "Commercial Baking Powders;" by M. L. Stone, on "The Prevention of Errors in Dispensing Poisons;" by H. Curry, on "Compound Spirit of Lavender;" by Prof. Sayre, on "The Possible Presence of an Alkaloid in Astragalus molissimus;" by R. S. Drake, on "Deviation from the Pharmacopœia;" by W. C. Johnston, on "The Metric System;" by F. E. Holliday, on "Excipients for Permanganate Pills;" by H. L. Raymond, on "Commercial Syrup of Ferrous Iodide;" by Prof. E. H. Bailey, on "Commercial Lead Chromate;" by A. J. Smith, on "Glycerin and Borax," and by George Weida, on "Cinchona Assays." W. W. Naylor, of Holton, was elected president; the secretary, assistant secretary, and treasurer were re-elected. The next meeting will be held in Atchison on the second Wednesday (12th) of June, 1889.

The Kentucky Pharmaceutical Association assembled in the Council chamber of Henderson to hold its annual meeting May 9, President J. W. Fowler in the chair. The annual address of the president was largely devoted to the injurious effects of patent and proprietary medicines, to the proposed amended pharmacy law, to the injustice of the liquor tax imposed on pharmacists, and to the necessity of pharmaceutical education, with words of encouragement and commendation to those young men seeking such professional advancement. Several papers on practical subjects and on ethical questions were read, and considerable discussion was had on the new draft of a pharmacy law, and on several clauses of the liquor law. W. S. Johnson, of Henderson, was chosen president, and W. B. McRoberts, of Stanford, and J. J. Brooks, of Richmond, were re-elected secretary and treasurer respectively. The twelfth annual meeting will take place at Crab Orchard Springs on the third Wednesday (15th) of May, 1889.

The Louisiana State Pharmaceutical Association had a large attendance at its sixth annual meeting, held in New Orleans, May 8th. President C. L. Keppler, in his annual address, referred to the healthy condition of the Association, to the Pharmaceutical department organized in connection with the medical school of Tulane University, to the proposed pharmacy law and to various local matters. The different officers and committees presented their reports which were duly considered and properly disposed of.

Among the papers read were the following: "Preparation and Preservation of Hypodermic Solutions," and "Preservation of Medicated Waters," by F. Lascar; on the "Morphiometric Assay of Opium," by R. N. Girling and T. R. Keene, and several on counter prescribing. A resolution was passed authorizing the secretary to purchase 300 copies of the National Formulary for the use of the members. The president C. L. Keppler, the recording secretary, L. F. Chalin, and the corresponding secretary, Mrs. Eliza Rudolf were reelected to these offices, and Erich Brand, of New Orleans, was elected treasurer. The Association finally adjourned to meet again in New Orleans on the second Wednesday (10th) of April, 1889.

The Massachusetts Pharmaceutical Association held its seventh annual meeting in the lecture room of the Massachusetts College of Pharmacy, June 5, President Manning delivered his annual address. The secretary, treasurer and the various committees presented their reports, and Mr. Whitney reported on the work done by the Pharmacy Board. Papers were read by H. Canning on "Liquor Sales and Liquor Licenses;" by B. F. Stacey on "Pharmacy Laws;" by A. P. Hemphill on "Internal Revenue and Temperance;" by L. L. Jenkins on the "Sale of Opiates;" by Prof. Markoe on "Incompatibles in Prescriptions;" by J.W. Colcord on "Ingluvin;" by J. A. Rice on "Vanilla and Vanillin;" by E. C. Durkee on "Extract of Vanilla," and on "Polish for Marble;" by A. D. Mowry on "Triturates;" by W. P. Draper on "Mucilage of Acacia;" and by H. J. Richardson on "Plasters." President for the current year, is B. F. Stacey, of Charlestown; secretary, J. W. Colcord, of Lynn, and treasurer, T. B. Nichols, of Salem. The next meeting will be held at New Bedford, in June, 1889, the date to be announced by the executive committee; F. R. Hadley is local secretary.

The Nebraska State Pharmaceutical Association had its seventh annual meeting in Lincoln, May 8th, president M. E. Shultz in the chair. The first business transacted was the consideration of amendments to the by-laws, reported on by a special committee. The annual address of the president and the reports of officers and of standing and special committees furnished considerable matter for discussion and action. The establishment of a School of Pharmacy in connection with the State University was favorably considered. Papers on apprentices, on progressive pharmacy, and on the influence of patent medicines were read. W. B. Shryock of Louisville is president for the current year. The secretary, C. J. Daubach of Lincoln, and the treasurer, J. Forsyth of Omaha, were reelected. The next meeting will again be held at Lincoln, on the second Tuesday (14th) of May, 1889; local secretary, A. J. Shilling.

The New Jersey Pharmaceutical Association assembled in Morristown, May 23d, at its eighteenth annual meeting, President G. S. Cook in the chair. The usual reports by the secretary and treasurer were read, the latter being coupled with the request by Mr. Wm. Rust to be relieved of the duties of treasurer at the close of the fiscal year, in February next. The president's report dealt largely with the relations between physicians and pharmacists, and with certain provisions of the pharmacy law. Reports were also read

on legislation, on internal taxation, on cutting of prices, and on other subjects, and invited considerable discussion. Papers were read by Dr. Eccles on "Colorless hydrastis;" by P. Hommel, on "Tasteless quinine mixtures," "Tincture of musk," and one entitled, "From seed to seed;" by A. Drescher, on "Opium Assay," and by F. B. Kilmer, on "Pharmaceutical legislation in New Jersey." A resolution was passed instructing the secretary to procure and send to each member of the Association a copy of the "National Formulary," about to be published. George H. White, of Jersey City, was elected President; W. M. Townley, of Newark, treasurer, and F. B. Kilmer, of New Brunswick, was re-elected secretary. The next meeting will be held in Bridgeton, the date to be fixed by the Executive Committee.

The Pennsylvania Pharmaceutical Association held its eleventh annual meeting in the armory of a military company in Titusville, commencing June 12th. Owing to the great distance many of the visiting members had to travel, the first session was held at 8 o'clock in the evening, when the local secretary, C. D. Lippincott, introduced the Hon. Mr. Schwartz, mayor of the city, who, in a brief address, welcomed the members to the hospitalities of the city. The president, W. L. Turner, of Philadelphia, responded, and then delivered his annual address, dwelling on the relation between pharmacy and medicine, urging thorough education, particularly in all that pertains to practical pharmacy, and referring to various matters of interest to the Association. The treasurer's report showed a cash balance on hand amounting to $259.31, and a considerable amount due from some of its members. The total number of active members is 599. The different committees presented their reports, which were appropriately disposed of. A proposition made to abolish the admission fee was amended, that it be reduced to $1.00. It was also proposed that newly elected members, having paid the admission fee and annual dues be hereafter furnished with a certificate of membership without additional charge. This requires an alteration of the by-laws, and was withdrawn at the last session for want of time. The furnishing of papers, or abstracts of the same for publication, was discussed, the Association declining to part with the papers, but leaving it to the authors to furnish to newspapers or journals copies or abstracts of their papers after they had been read before the Association. A recommendation was adopted that the committee on adulteration and sophistication give particular attention to the class of liquid officinal preparations usually sold by general dealers, and where possible give such information to the pharmacy board as will enable them to prosecute violations of section 9 of the pharmacy law.

The committee appointed to attend the meeting of the State Medical Society at Bedford Springs in 1887, reported their cordial reception and the favorable action taken by the Society. A committee of five on the relations of medicine and pharmacy was subsequently directed to be appointed, and it is the intention of amending the by-laws at the next meeting, with the view of making this a standing committee.

The following papers were read:

A Concise History of Pharmacy, with conspicuous contrasts, ancient and

modern, by Wm. Harris. The paper cannot be abstracted; quotations from several works, particularly from the London Dispensatory of 1718, showed the progress made in pharmacy up to the present time.

Should Druggists Register as Physicians? Mr. Harris referred to the charter of the Society of Apothecaries in England, and endeavored to deduce therefrom the right of pharmacists to practice medicine. Stating that the law of Pennsylvania gives to apothecaries having practiced medicine and pharmacy for a period of ten years prior to June 8th, 1881, the right to register as physicians, he answered the above query in the affirmative. The arguments advanced by the author, and more particularly the conclusion, were warmly contested by Mr. Duble and other members. In the discussion the eleventh section of the pharmacy law, giving graduates in medicine the right to register as pharmacists without examination, was deservedly criticized; but it was contended that a similar wrong should not be committed in retaliation.

The Promotion of Fraternal Feeling Among Pharmacists, by W. H. Reed. The good influences of associations and attendance at their meetings are discussed in their various aspects.

The Preliminary Training of Apprentices, by G. W. Kennedy. Not only is the necessity of a good school education emphasized, but other requirements are pointed out, like habits of preciseness, politeness in conversation, cultivation of judgment, etc.

Impure Cream of Tartar. Frank Thompson had found the cream of tartar offered by several drughouses to be pure, while samples obtained from grocers contained from twenty-five to seventy-five per cent. of starchy matter, which was left behind on dissolving the bitartrate in potassa solution.

Paris Green. G. W. Kennedy examined six commercial samples and found five of them to be substantially pure, though containing uncombined arsenious acid which could be extracted by ammonia. One sample contained nearly twenty per cent. of white clay.

Irish Moss as a Substitute for Gum Arabic. J. F. Patton confirms the utility of Irish moss in the preparation of emulsions.

Pepsin. Wm. Harris advocates the admission into the next pharmacopœia of a pepsin digesting at least nine hundred times its weight of coagulated albumen in five or six hours at a temperature of 105° F. Its preparation is neither very difficult nor costly, and any apothecary of ordinary skill can prepare and have it fresh and reliable. Samples were exhibited prepared by the author.

Abstractum Jalapæ by Wm. L. Turner. Seven samples of jalap, on being assayed, yielded from 6.35 to 10.36 per cent. of resin; from the latter sample, by careful selection, a small quantity could be obtained yielding the required 12 per cent., and a sample procured from Dr. Squibb yielded 19 per cent. of resin. In view of this great variation, it is proposed to prepare the abstract by thoroughly incorporating one part of resin of jalap with three parts of sugar of milk.

Two of the papers read at the meeting are published in this number;

they are entitled "The genus Luffa" and "Notes on some old remedies." Of the paper by Mr. Jos. W. England, "Reference table of doses," the introductory part will be found on another page, and it is proposed to print the table in the next number.

The officers elected are Wm. Harris of Hamburg, president; John W. Miller of Allegheny and J. H. Stein of Reading, vice presidents; J. A. Miller of Harrisburg, secretary and Jos. L. Lemberger of Lebanon, treasurer. The association adjourned on Wednesday night to meet next year in Scranton on the second Tuesday (11th) of June; Wm. H. McGarrah was elected local secretary.

Owing to arrangements previously made by the druggists of Titusville for an excursion, the Association finished its labors on Wednesday, the fourth session closing at 11 P. M. On Thursday morning the members and friends, numbering about two hundred, left on the 7.45 train for Mayville, and there took a steamer which conveyed the party to some of the places of interest on Lake Chautauqua. Coleman's band was in attendance, and dancing was indulged in by some of the company. The party landed at Jamestown, N.Y., where dinner was taken at the Sherman House, and where they were hospitably received by the Mayor and the druggists. From here several of the members started for home, others left at Corry, and the majority departed from Titusville by early train on Friday. A party of nine drove on Friday forenoon to the farm of Mr. W. P. Black, nine miles from Titusville, to witness the shooting of an oil well. Sixty quarts of nitroglycerin were lowered in three canisters to a depth of 900 feet, and after having been exploded, ejected from the depth a mixture of water, mud and oil with such a force as to carry off the top of the derrick. This to the visitors' novel sight amply repaid for the delay. After all the visitors had left, Titusville and the neighboring country was, on Friday evening, visited by severe thunder storms, causing considerable damage to property and, for a time, interrupting travel by railroad.

The Virginia Pharmaceutical Association commenced its seventh annual meeting in Danville May 8th, and adjourned on the next evening. President R. Brydon read his annual address, making various recommendations, with the view of increasing the interest in the meetings. Reports were read from the officers and the various committees, including one on the National Formulary. The proposition requiring on each label of patent medicines a quantitative formula was favorably considered. Papers were read by Prof. F. P. Dunning on "Oxidation of Sulphites;" by T. F. Knock, on "Hydronaphthol;" by J. A. Miller, on "Simple Syrup;" by A. W. Jacobs, on "Oils of Orange and Lemon," and by J. W. Thomas, on "Peanut and Cotton-seed Oils." Dr. E. A. Craighill was elected president, and the following officers were re-elected: C. B. Fleet, secretary; T. Roberts Baker, corresponding secretary, and F. H. Masi, treasurer. The next meeting will be held at the Hygeia Hotel, Old Point Comfort, on the third Tuesday (18th) of June, 1888. The local secretary is F. H. Masi, of Norfolk.

EDITORIAL DEPARTMENT.

Medical and Pharmaceutical Congresses at Barcelona, Spain.—During the latter half of the present year a universal exposition will be held in Barcelona, and recently arrangements have been perfected for the holding of two congresses, one medical and the other pharmaceutical, during the month of September. Membership may be secured by the payment of an inscription fee of ten francs. All members may participate in the proceedings and the discussions; but persons not possessing an academic title giving authority to practice a profession, are required to present written communications to a scientific subcommittee for preliminary consideration. The official language will be Spanish; but written and verbal communications may be presented in any other Romance language, accompanied with a condensed abstract giving the conclusions. A joint public session of both congresses will be held September 9th, at noon, after which each congress will organize separately and transact the business coming before it in four sections. The final adjournment will take place September 15th, when the minutes and essays will be handed to the Committee on Organization for publication.

The four sections of the pharmaceutical congress and the subjects assigned to each section for deliberation, are as follows.

Section on general questions.—1. Theories of chemistry best adapted for the study of pharmacy.

2. Processes of disinfection in various epidemics; the disinfectants meriting preference, and their chemical action.

3. The importance of artifical mineral waters, and the conditions for arriving at reliable conclusions on this subject.

4. The study of natural medical substances.

5. The influence of Spanish authors on the progress of pharmacology.

6. The theories of fermentation.

Section on Pharmacology—1. Pharmaco-zoological and pharmaco-phytological study of gum lac.

2. The conditions under which ranunculaceous drugs should be employed for preparations with the view of securing the greatest activity.

3. The pharmacological importance of the localization of the active principles of plants.

4. The preparation of volatile oils from Labiatæ in Spain.

Section on Practical Pharmacy.—1. Bismuth subnitrate of the Spanish pharmacopœia, its uniformity of composition and permanence.

2. Advantages and disadvantages of lanolin and petrolatum in ointments.

3. The extracts and the methods of their preparation.

4. Pharmaceutical legislation in regard to the progress of pharmacy.

Section on Chemistry.—1. The means of combining astringents with iron preparations without altering their properties or lessening their effects.

2. The chemistry and pharmacy of compounds of antimony.

3. The best reagents for the analysis of urine.

4. Importance of spectral analysis.

Elixir of Theine Hydrobromate.—The quantity of acid directed in the formula, published on page 282, should be f℥i (instead of f℥i). The corrected formula reads: Theine, 90 grains; dilute hydrobromic acid and water, of each, 1 fluidounce; elixir of orange, sufficient for one pint.

The *Druggists' Mutual Fire Insurance Company* has been brought to the notice of the members of the drug trade who were present at the recent meetings of the various State Pharmaceutical Associations. A year ago the company was organized under the auspices of the National Wholesale Druggists' Association; a charter was obtained under the laws of Pennsylvania, and active business was commenced October 17th, 1887. The central office is located in Philadelphia in the Forrest building, 119 South Fourth street, and the business is conducted by a Board of Directors and an Executive Committee, composed of prominent druggists, residing in the principal cities from Maine and the Atlantic States to Louisiana and Minnesota.

The original capital consists of an advance premium fund of $100,000, bearing six per cent. interest, and it is intended to reserve the accumulating profits until a capital of $200,000 is secured, when the profits will be employed in cancelling the scrip certificates, to be issued annually to the policy-holders, after the profits for the past year have been determined. The rates of insurance charged are the same as those established by the stock companies; but the policy-holders will participate in the profits, the dividend scrip bearing interest. In this manner, the benefits of the company are mutual, and the policy-holders are exempt from all assessment.

Though organized by druggists primarily for the benefit of druggists, the company will accept also risks of buildings, household goods and other property of no more hazardous nature than drug stocks, a careful scrutiny being made of both the moral and material hazard.

Moreover, the company considers it as a prominent part of its mission to encourage by every possible means the thoughtful consideration of all methods for reducing fire hazard, and thus to lessen the losses, and increase the amount of dividend to each policy holder. A circular intended to be posted in conspicuous places, has been issued, giving plain and intelligent advice in regard to the storage and handling of goods, waste and packing material; the use of lamps, gas, steam, electricity, and to other matters which under various circumstances may cause explosions or conflagrations.

The present officers of the company are Robert Shoemaker, president, Edward H. Hance, treasurer, and E. R. Hunt, secretary.

The National Formulary of Unofficinal Preparations will be issued before the present number of the JOURNAL reaches our readers. It contains about 190 octavo pages, and gives 435 formulas for preparations in daily use by pharmacists and druggists. As stated in our last number, it will be for sale by the acting authorized agents of the American Pharmaceutical Association, also by wholesale druggists, booksellers, and others interested in the work. The price, including postage, has been fixed at 75 cents, bound in cloth; $1.10, cloth, interleaved; 90 cents, cloth, with raised nails, and $1.10 bound in sheep.

Prize Studies of Tornadoes.—The *American Meteorological Journal*, desiring to direct the attention of students to tornadoes, in hopes that valuable results may be obtained, offers the following prizes: For the best original essay on tornadoes, or description of a tornado, $200 will be given. For the second best, $50. And among those worthy of special mention $50 will be divided.

The essays must be sent to either of the editors, Professor Harrington, Astronomical Observatory, Ann Arbor, Michigan, or A. Lawrence Rotch, Blue Hill Meteorological Observatory, Readville, Mass., U. S. A., before the first day of July, 1889. They must be signed by a *nom de plume*, and be accompanied by a sealed envelope, addressed with same *nom de plume*, and enclosing the real name and address of the author. Three independent and capable judges will be selected to award the prizes. A circular giving fuller details can be obtained by application to Professor Harrington.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Twenty-ninth Annual Report of the Inspector of Milk and Vinegar. Boston: Rockwell & Churchill, printers, 1888, 8vo., pp. 76.

A comprehensive report giving the results of the investigations made by the inspector, Prof. Jas. F. Babcock, during the preceding year. The good effect produced by these continued inspections is shown by a number of tables and by graphic representations of the steady increase of the percentage of pure milk sold in Boston during the years, 1883 to 1887.

Foods and Food Adulterants. Part third: Fermented alcoholic beverages, malt liquors, wine and cider. By C. A. Crampton, Assistant Chemist. Washington: Government Printing Office, 1887, pp. 261-399.

The pamphlet enters very fully into the examination of the three classes of beverages mentioned in the title, and gives interesting details of the analytical researches into the proportion of the proximate constituents of the beverages, and the presence of adulterations. We mention here only that out of seventy samples of American wines, eighteen, or over one-fourth, had received an addition of salicylic acid, and thirteen had been preserved by the use of sulphurous acid, either as such or in the shape of a sulphite; one of the samples contained both these agents. Of forty samples of red wines one was found to be artificially colored with aniline red.

Kinologische Studiën. Dr. J. E. De Vrij.

"Quinological Studies" is the general title of some sixty papers by Professor De Vrij published in the "Nieurv Tijdschrift voor de Pharmacie in Nederland," for reprints of a number of which we are indebted to the author, who as is well known, has given many years of labor to investigating the composition of cinchona barks, and the chemistry of the cinchona alkaloids.

The Texas Health Journal. Edited by J. R. Briggs, M. D. Published by the Health Journal Publishing Company, Dallas, Texas.

This is a new monthly, which will be regularly issued, beginning with July. It will be devoted to hygienic matters, which, it is intended, will be presented in a manner comprehensive to all intelligent persons. Each number will contain 32 pages, and the subscription price will be $2.0 per year.

Fifth Annual Report of the Board of Control of the State Agricultural Experimental Station, at Amherst, Mass. Boston, 1888; 8vo., pp. 267.

This comprehensive report by the director, Professor C. A. Goessmann, is for the year 1887, and gives a full account of the work done at the Station during that year.

Nineteenth Annual Report of the State Board of Health of Massachusetts. Boston, 1888, pp. 375.

This, like the preceding, is one of the Public State Documents for the year 1887. It contains reports on water supply and sewerage, on sewage disposal, on food and drug inspection, on oleomargarin, on mortality, and on the heating and ventilation of school houses.

Russian and American Petroleum.. By Prof. S. P. Sadtler. Pp. 12.

A reprint from the May number of the Journal of the Franklin Institute of a lecture delivered before the Institute by the author.

OBITUARY.

Rachel L. Bodley, M. D., professor of chemistry and dean of the Woman's Medical College, died in Philadelphia June 15th, at the age of 56 years. The deceased was identified with the above College for 23 years, and was one of its most valued teachers. Botany and chemistry were her favorite sciences. Fourteen years ago she suggested the propriety of celebrating the one hundreth anniversary of the discovery of oxygen by Priestley; the suggestion was carried out, and at the "Centennial of Chemistry" which took place at Northumberland, Pennsylvania, the last home and resting place of Priestley, she was elected vice president, though absent on a botanical excursion to Colorado. She was a native of Cincinnati, O.

Theodor Ronnefeld, for many years in business in Detroit, died in that city after a lingering illness, June 9th, aged 56 years. He was an excellent pharmacist, an upright man, an agreeable companion, and a warm hearted friend.

Lorren S. Vincent, Ph. G., class 1886, died at Flint, Michigan, May 27th. He was born in Genesee Co., N. Y., January 11th, 1860, and at the age of eight years came with his parents to Flint, where after graduating from the high school, he learned the drug business and subsequently attended the Philadelphia College of Pharmacy. He commenced business in Dayton, O., but failing in health he was compelled to relinquish it about a year ago.